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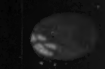

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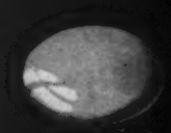

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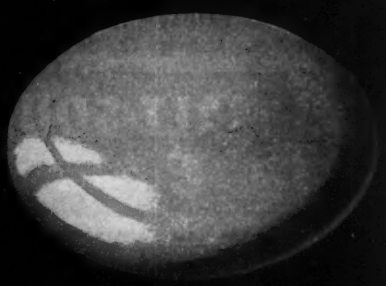

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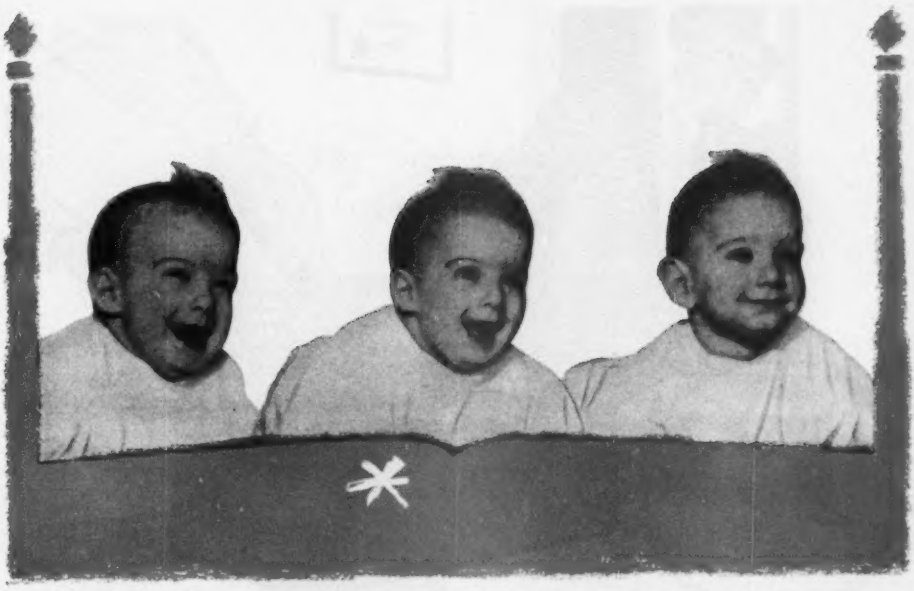

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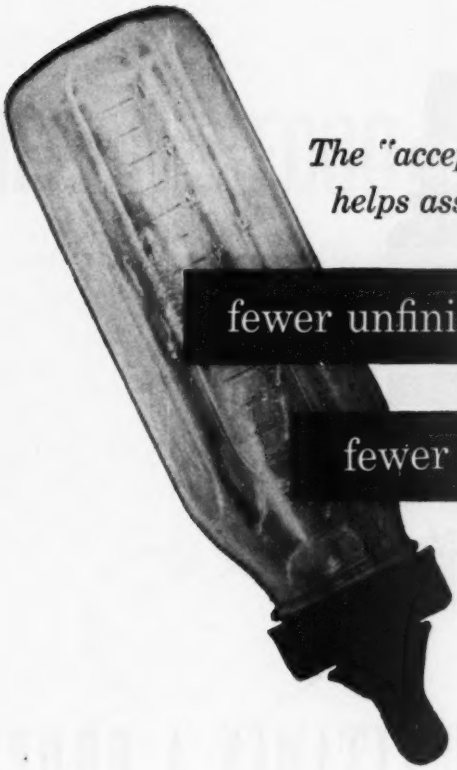

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1. Bruce, J. W., Hackett, L. J. and Bickel, J. E.: Feeding Premature Infants, J. Pediat. 35:201 (Aug.) 1949.

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1. Lewis, J. M., et al.: Jl. Pediatrics 31:496, 1947
2. Kramer, B., et al.: Am. Jl. Dis. Child. 73:543, 1947
3. Halpern, G. R., et al.: Science 106:40, 1947
4. Nutrition Reviews 5:286, 1947
5. Clifford, S. H. and Weller, K. H.: Pediatrics 1:505, 1948
6. Popper, H., et al.: Gastroenterology 10:987, 1948
7. Davidson, D. M., et al.: Jl. Invest. Derm. 12:221, 1949
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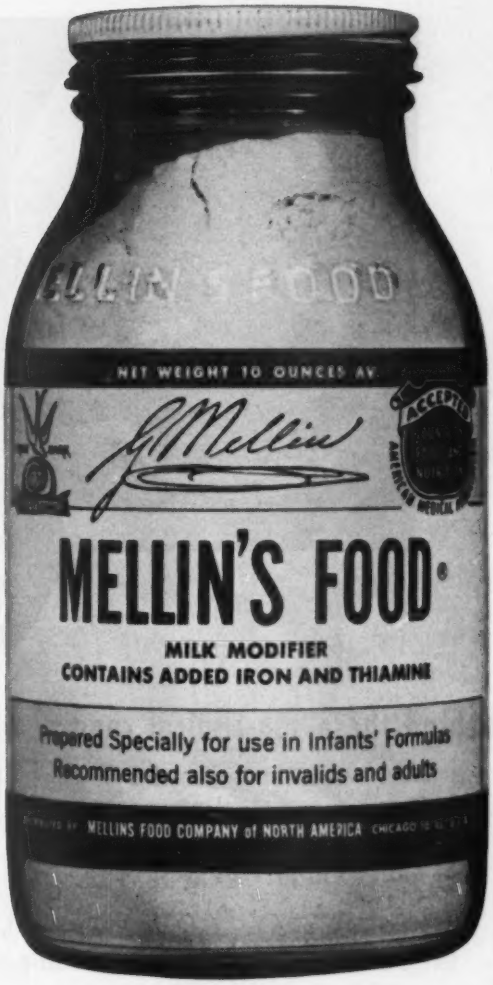
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American Journal of Diseases of Children

VOLUME 84 SEPTEMBER 1952 NUMBER 3

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ENDOCARDIAL SCLEROSIS

RICHARD W. BLUMBERG, M.D.
ATLANTA
AND
ROBERT A. LYON, M.D.
CINCINNATI

IN OUR experience the cardiac lesion usually known as endocardial sclerosis is one of the commonest types of fatal heart disease of infancy. The condition, however, is not well known, and the symptoms have not been emphasized in most textbooks. It is also evident that the multiplicity of names attached to the disease in medical reports has led to confusion. In early descriptions the condition was called "fetal endocarditis" or was included under the title of "congenital idiopathic hypertrophy" of the heart. Recently, such terms as endocardial fibrosis, prenatal fibroelastosis, elastic tissue hyperplasia, endocardial sclerosis, and others have been used to describe what is apparently a single pathologic condition. Since the cause and the exact nature of the disease are still obscure, it is difficult to select a title which is satisfactory. The name endocardial sclerosis is employed here because it describes fairly accurately and briefly the gross appearance of the heart at autopsy and makes no commitment regarding the age at which it might originate or the origin of the lesion.

It is the purpose of this paper to review in greater detail some of the clinical features of the disease in 25 children whom we have observed and in 69 additional patients previously reported on by others.[1]

From the Department of Pediatrics, Emory University School of Medicine, Atlanta (Dr. Blumberg), and the Department of Pediatrics, University of Cincinnati College of Medicine and the Children's Hospital Research Foundation (Dr. Lyon).

1. (*a*) Kugel, M. A., and Stoloff, E. G.: Dilatation and Hypertrophy of the Heart in Infants and Young Children with Myocardial Degeneration and Fibrosis (So-Called Congenital Idiopathic Hypertrophy, Am. J. Dis. Child. **45**:828, 1933. (*b*) Kenney, F. E., and Sanes, S.: Dilatation and Hypertrophy of the Heart in Infancy Due to Parenchymatous Myocarditis, J. Pediat. **3**:321, 1933 (*c*) Levine, H. D.: Cardiac Hypertrophy in Infancy Associated with Thickened Endocardium and Coarctation of Aorta, Am. J. Dis. Child. **48**:1072, 1934. (*d*) Powers, G. F., and LeCompte, P. M.: Remarks on a Case of Congenital Idiopathic Hypertrophy of the Heart, J. Pediat. **13**:760, 1938. (*e*) Benjamin, B., and Simon, M. A.: So-Called Congenital Idiopathic Hypertrophy of the Heart, Am. J. Dis. Child. **59**:842, 1940. (*f*) Kugel, M. A.: Enlargement of the Heart in Infants and Young Children, Am. Heart J. **17**:602, 1939. (*g*) Weisman, S. J.: Congenital Idiopathic Cardiac Hypertrophy, Arch. Path. **33**:365, 1942. (*h*) Weinberg, T., and Himelfarb, A. J.: Endocardial Fibroelastosis (So-Called Fetal Endocarditis): Report of 2 Cases Occurring in Siblings, Bull. Johns Hopkins Hosp. **72**:299, 1943. (*i*) Cosgrove, G. E., Jr., and Kaump, D. H.: Endocardial Sclerosis in Infants and Children, Am. J. Clin. Path. **16**:322, 1946. (*j*) Vulliamy, D. G.: Idiopathic Cardiac Hypertrophy, Brit.

(Footnote continued on next page)

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The postmortem examinations of the Cincinnati group were performed by Dr. Ralph J. Johansmann, of the pathology department of the University of Cincinnati College of Medicine. The necropsy of the Grady-Egleston group was carried out by members of the department of pathology, Emory University School of Medicine, Dr. W. Sheldon, professor; the autopsy material from the Crawford W. Long Memorial Hospital was furnished by Dr. Darrel Ayer, pathologist.

Patients were selected on the basis of the pathological findings of a whitish coating of fibroelastic tissue on the endocardium. In every instance the fibrotic changes occurred on the walls of the left ventricle or atrium, and when more extensive they involved the endocardium of the right side of the heart and that of the valves in addition. In no instance was this tissue found on the valves only, as others have reported (Craig [1k]). The extension of fibrous tissue into the myocardium and the presence of cellular infiltrate or necrosis did not exclude patients from our consideration, even though such lesions resembled those of interstitial myocarditis, which may or may not be a separate disease.

Patients with congenital defects of the heart which could influence the course of the illness, irrespective of an associated endocardial sclerosis, have been excluded from this review. Such conditions were the anomalous origin of the left coronary artery from the pulmonary artery, gross abnormalities of the aorta, or other intrinsic cardiac malformations. Patent ductus arteriosus or coarctation of the aorta was not used as a basis for exclusion from the group if the condition had produced no symptoms previous to the onset of the acute cardiac failure. Such anomalies might have influenced the production of endocardial sclerosis in these patients, although they rarely do so in others.

The same criteria were used for the selection of the 69 patients reported in the literature.[2] An interesting group of patients were those with fibrotic lesions of the heart limited to the vascular system or such cases as Schefrin [3] described in which extensive fibrosis occurred only in the myocardium, but none of these reports became a part of this survey. However, patients with coarctation of the aorta, which did not seem to interfere with normal early life, and those with aortic valvular lesions, some of them apparently due to the endocardial sclerosis itself, were included in the review.

Heart J. **9**:161, 1947. (*k*) Craig, J. M.: Congenital Endocardial Sclerosis, Bull. Internat. A. M. Mus. **30**:15, 1949. (*l*) Farber, S., and Hubbard, J.: Fetal Endomyocarditis: Intrauterine Infection as the Cause of Congenital Cardiac Anomalies, Am. J. M. Sc. **186**:705, 1933. (*m*) Macgregor, R. R., and McKendry, R.: Fetal Endocarditis: Report of a Case, Canad. M. A. J. **50**:433, 1944. (*n*) Eigel, E. G., and Lynxwiler, C. P.: Cardiac Enlargement in Infancy: Report of a Case, Arch. Pediat. **63**:433, 1946. (*o*) Mahon, G. S.: Idiopathic Hypertrophy of the Heart with Endocardial Fibrosis: Report of 2 Cases, Am. Heart. J. **12**:608, 1936. (*p*) Gross, P.: Concept of Fetal Endocarditis: General Review with Report of Illustrative Case, Arch. Path. **31**:163, 1941. (*q*) Sano, M. E., and Anderson, N. A.: Elastic Tissue Hyperplasia of the Endocardium, ibid. **33**:533, 1942. (*r*) Stadler, H. E.; Reid, C. A., and Friedman, H. P.: Prenatal Fibroelastosis (Fetal Endocarditis) Manifested Clinically by Total Heart Block, J. Pediat. **36**:370, 1950. (*s*) Glynn, L. E., and Reinhold, J. D. L.: The Relationship of Idiopathic Cardiac Hypertrophy to the Foetal Endocarditis, Arch. Dis. Childhood **25**:170, 1950. (*t*) Collier, F. C., and Rosahan, P. D.: Endocardial Fibroelastosis: Report of 2 Cases, Pediatrics **7**:175, 1951.

2. Two recent reports since our data were compiled are those of Edmonds, H. W., and Seelye, W. B.: Pediatrics **7**:651 (May) 1951, and Hill, W. T., and Reilly, W. A.: A. M. A. Am. J. Dis. Child. **82**:579 (Nov.) 1951.

3. Schefrin, A. E.: Myocardial Fibrosis in Infancy, J. Pediat. **36**:360, 1950.

RESULTS

The first portion of this report deals with the clinical manifestations of the disease observed in our 25 patients and in 69 patients reported previously by other authors.[1] The results are summarized in Tables 1 and 2. The second portion deals with more detailed accounts of our own group of patients.

Age.—The disease is distinctly one of infancy. Symptoms were noticed in 34 patients (36%) before they were 2 weeks of age, and in 61 instances (65%) the onset of the disease occurred before the age of 6 months. Eighty-six children (91%) died before the age of 2 years. When the entire group of 94 patients were classified according to the location and extent of the endocardial sclerosis, it was noted that in the infants who had involvement of the aortic valve in addition to the wall of the left ventricle symptoms of cardiac failure developed and they died at

TABLE 1.—*Age of Patients and Duration of Symptoms*

	Patients	
	No.	% of Total
Age at onset of symptoms		
Under 2 wk.	34	36
2 wk. to 6 mo.	36	38
Over 6 mo.	22	23
Not known	2	2
Total	94	99
Age at death		
Under 2 wk.	18	19
2 wk. to 6 mo.	43	46
Over 6 mo.	33	35
Not known	..	..
Total	94	100
Duration of symptoms		
Under 2 wk.	48	51
2 wk. to 6 mo.	33	35
Over 6 mo.	11	12
Not known	2	2
Total	94	100

earlier ages than the average for the group as a whole. However, the differences were slight and the number of patients small; hence little significance could be attached to the finding.

Mode of Onset and Duration.—In a disease usually diagnosed by symptoms alone it is often difficult to evaluate observations reported by various authors with different points of view and different interests. Certain patterns of behavior were significant. The symptoms were those of heart failure which developed suddenly and continued with increasing severity until the patient died. Infants considered to have been entirely well suddenly began to breathe rapidly, vomit or cough, and arrived at the hospital literally gasping for breath. Twenty-seven patients survived for less than two days after the onset of symptoms, and 48 (51%) died within two weeks of the initial attack.

In other patients symptoms of heart failure of less degrees of severity were noted over long periods, sometimes from birth; but they occurred in episodes with remissions and recurrences until a final severe attack caused death. It was not always

easy to determine in these infants when the cardiac disease began, because the symptoms were so mild and atypical that other illnesses were suspected before the major disorder became apparent. Pneumonia, asthma, and other respiratory disorders were most frequently suspected. It was only when roentgenograms of the chest were taken that attention was directed to the enlarged heart. Other infants had digestive symptoms of vomiting, failure to eat, or severe diarrhea at the onset of their illness, and it was difficult to decide whether these manifestations represented specific infections or the onset of cardiac failure.

SPECIFIC SYMPTOMS

As has been stated, the most frequent symptoms were those characteristic of cardiac failure. The specific symptoms are listed in Table 2. Dyspnea and tachycardia were almost universal in our series of patients, and dyspnea was the most frequent symptom reported by others, occurring in 70 instances (74%) of the total

TABLE 2.—*Clinical Manifestations*

	Patients	
	No.	%
Dyspnea	70	74
Cyanosis		
Permanent	17	18
Occasional or terminal	44	47
Edema	13	14
Enlarged liver	36	38
Cough	27	29
Vomiting	24	26
Anorexia	21	22
Diarrhea	13	14
Convulsions	4	4
Pain (precordial or epigastric)	5	5
Cardiac enlargement	88	94
Murmurs	24	26

group of 94. When associated with cough, this symptom suggested the diagnosis of pneumonia.

Cyanosis was mentioned frequently but usually appeared only as a terminal symptom or during the episodes of acute cardiac failure. In the series of 94 patients, cyanosis was observed in 61 instances, but in only 17 (19%) did it occur except in terminal stages. Between attacks of failure the color of most of the children was normal or pale. A large percentage of the infants who died in the first two weeks of life had been cyanotic since birth. Some of these patients had other lesions which may have contributed to the condition. In two of our own group of patients, autopsy showed insufficient lung expansion, and a third patient had extensive cardiac involvement with stenosis of both aortic and mitral valves. Cyanosis was a prominent symptom in a large percentage of the reported cases in which the fibrotic lesions of the endocardium were extensive and the aortic valve was involved. In this group it occurred early in the course of the illness and was rapidly followed by death in an unusually large number of instances.

Edema was noted in nine of our patients but reported in only four of the reviewed cases. The face, hands, and feet were usually involved and occasionally

the abdominal wall. In one of our patients, edema was the outstanding symptom, and a diagnosis of nephritis was entertained at first.

Liver enlargement was noted in 36 instances (38%). It seemed likely that acute passive congestion was the cause of this increase in size during terminal stages of the disease.

The symptom of cough was difficult to evaluate. Record was made of it in 27 patients (29% of the group), but its cause and significance were hard to determine. In some instances it seemed to be the manifestation of a respiratory infection preceding heart failure; in other cases it seemed to be due to pressure of the enlarged heart on a bronchus or some portion of the lung, or finally it may have been the result of acute passive congestion of the lungs.

Vomiting, anorexia, and diarrhea are such common manifestations of any illness of infancy that their importance in the diagnosis of this form of cardiac disease is doubtful. Cardiac failure probably contributed to the frequency of their occurrence and their severity, and if special attention had been paid to recording these symptoms, they probably would have appeared in percentages higher than the 14 to 26% listed in the table. In our series of 25 patients, vomiting was noted in 16 (64%).

Convulsions occurred in four of the reported cases and in none of our own. It seems unlikely that the symptom had any direct connection with the disease.

Precordial pain in infants and young children is difficult to determine or to evaluate. A history was frequently obtained of infants "crying out as if in pain" or "pulling their legs up as if having colicky pain." Such episodes occur in infants from a variety of causes, and therefore the symptom may have been unrelated to the disease of the heart. Sometimes the crying was accompanied by pallor and profuse perspiration, such as that seen in attacks of angina. A few of the older children had definite complaints of precordial pain. The oldest child in our own series, a boy of 11 years, had severe attacks of pain, which localized in the precordial and epigastric areas.

Enlargement of the heart occurred in almost every instance. Only one of our patients and only five of those reported by others had no clinical or roentgenologic evidence of enlargement. In some of the young infants, the enlargement was not detected clinically but appeared in roentgenograms of the chest which were taken because the physical signs suggested pulmonary consolidation. Roentgenographic evidence of enlargement quickly turned the focus of attention to the heart. The great increase in the weights of the hearts at autopsy was one of the outstanding features of the disease.

In many of the older infants and children, the cardiac enlargement was detected clinically early in the course of the disease and x-rays showed such large globular cardiac shadows that pericardial effusion was suspected and unsuccessful attempts were made to remove fluid by insertion of a needle into the pericardial space. In others the heart filled such a large portion of the left chest that the radiologist suspected pleural effusion or pulmonary consolidation. One of our patients was found at autopsy to have atelectasis of the lower lobe of the left lung as a result of pressure of the heart on the left main bronchus.

Murmurs were reported in 24 children, or 25% of the entire group of 94 patients. They were usually described as soft systolic murmurs at the apical area. Often they were inconstant or they developed during the episodes of cardiac failure

or in terminal stages of the illness, when cardiac dilatation may have been a contributing factor. Some of these murmurs may have been inconsequential or accidental murmurs which occur with some frequency in infancy, especially in association with illness when the heart is itself normal. Four patients of the group had harsh systolic murmurs, and three others had murmurs which were described as "to and fro" in time. One child, found at autopsy to have mitral and aortic stenosis, had had a loud systolic murmur and a thrill.

Electrocardiograms taken on a relatively small number of patients did not show distinctive or pathognomonic changes. The findings were not included in table 2 but are listed in the records of our own patients. Usually only the three standard leads were taken. The most frequent findings were depression, flattening, and sometimes inversion of T waves, abnormalities usually associated with myocardial failure. Definite inversion of T waves in infants, a finding once considered highly suggestive of congenital abnormalities of the coronary arteries, was found to occur in some of these patients with endocardial sclerosis only.

Conduction disturbances were evident in a few instances and consisted usually of a prolongation of the P-R interval to 0.20 second or more. Several patients had complete heart block.

Other laboratory procedures have not revealed any particular disorder. One of our patients, who was continuously cyanotic from birth, had 8,050,000 red cells and 20.2 gm. of hemoglobin per 100 cc. Another child, who had remained in a stage of chronic heart failure for a year without becoming cyanotic, likewise had polycythemia (6,800,000 red cells) and a hemoglobin level of 17 gm. On the other hand, a few older infants had reduction in hemoglobin levels and numbers of red cells well below average but within the range observed in nutritional anemia, which occurs frequently at this age. A few reports of severe anemia, notably those of Schefrin [3] and Collier and Rosahan,[16] in which hemoglobin levels of less than 2 gm. and red cell counts of less than 2,000,000 suggested acute hemorrhagic or hemolytic processes which may or may not have been related to the cardiac disease.

TREATMENT

No form of therapy gave uniformly good results. The usual treatment of patients with cardiac failure was employed in most instances and consisted of rest, oxygen inhalation, and the administration of digitalis and, if edema or congestion was evident, the mercurial diuretics. Some patients improved considerably as soon as they were digitalized, and they remained in fair health for long periods on this form of therapy before the final episodes of failure took place.

REPORT OF PERSONAL CASES

The symptoms and signs manifested by our 25 patients have been included in Tables 3 and 4. A short case history of each patient follows, together with four roentgenograms illustrating the cardiac enlargement and two tables which summarize the clinical manifestations and the pathological findings of our own series.

CASE 1.—P. W., a white girl, 7½ months of age, was the result of the 10th pregnancy of her 44-year-old mother. The mother had "rheumatism and bronchitis" throughout this pregnancy. One sibling, 8 years of age had had an enlarged heart and many bouts of congestive failure, but no definite diagnosis was established and the child is not improved. P. W. had a rapid

TABLE 3.—*Summary of Symptoms and Signs*

Case No.	Age at Death	Sex	Race	Dyspnea	Cyanosis: Occasional or Terminal	Cyanosis: Permanent	Vomiting	Cough	Edema	Cardiac Murmur	Size of Heart X-Ray	ECG	Duration of Symptoms
1	7½ mo.	F	W	+++	+++	.....	.....	+	.....	Apical systolic	Large	Wide QRS$_{II-III}$	7½ mo.
2	2½ yr.	M	W	+++	.....	+++	.....	.....	++	.....	Large	.....	2½ yr.
3	9 mo.	F	W	++	++	.....	.....	.....	.....	.....	.....	.....	2 days
4	17 mo.	M	W	++	++	.....	++	+	+	.....	Large	T_{II} inverted	1 mo.
5	6 wk.	F	W	++	.....	.....	+	++	.....	.....	Large	.....	5 days
6	3 mo.	F	W	+++	+	.....	+++	+	.....	.....	Large	Inverted T_{II}-T_{III}	2 mo.
7	5½ mo.	F	W	++	+++	.....	+	+++	.....	.....	.....	.....	7 days
8	7½ mo.	F	N	+++	+++	.....	.....	+	+++	.....	Large	A-V dissociation	3 mo.
9	14½ mo.	F	W	++	+	.....	++	+++	+++	Apical systolic	Large	.....	9½ mo.
10	7 mo.	M	W	++	.....	.....	++	.....	.....	.....	.....	.....	9 days
11	7 mo.	F	W	+++	+	.....	+	.....	.....	.....	Large	.....	2 days
12	2 yr.	M	W	+++	.....	+	++	.....	+++	Apical systolic	Large	.....	2 yr.
13	5 min.	M	N	+	.....	+	.....	.....	.....	.....	.....	.....	5 min
14	2½ mo.	F	W	+++	+	.....	.....	.....	.....	.....	Large	.....	2½ mo.
15	18 mo.	F	W	+++	+	.....	++	.....	.....	.....	Large	T_I flat	3 mo.
16	11½ yr.	F	N	+++	+	.....	+	+	++	.....	Large	PR-0.26; left bundle branch block	22 mo.
17	6 hr.	M	W	+++	.....	+++	.....	.....	.....	.....	Large	.....	6 hr.
18	6 wk.	M	W	+++	+++	.....	.....	+	.....	Systolic lt. sternal border	Large	Right axis deviation	2 days
19	8 mo.	M	W	+++	+	.....	+	++	.....	.....	.....	.....	2½ mo.
20	4½ mo.	F	W	++	.....	++	++	+	.....	Systolic and diastolic in left sternal area	.....	.....	4½ mo.
21	3 mo.	M	W	+++	.....	.....	+	.....	.....	Apical systolic	Normal	.....	3 mo.
22	7½ mo.	F	N	+++	.....	.....	.....	++	.....	Apical systolic	Large	.....	2 days
23	15 mo.	F	W	++	+	.....	.....	.....	++	.....	Large	.....	2 wk.
24	28 mo.	F	W	+++	++	.....	+++	+	+++	.....	Large	Right axis deviation; low T_I, T_{II}, T_{III}	13 mo.
25	16 mo.	M	W	+++	+	.....	++	+	+++	Systolic sternal area	Large	Low T_I, T_{II}	8 mo.

TABLE 4.—*Summary of Pathological Lesions*

Case No.	Age at Death	Observed Weight of Heart, Gm.	Approx. Average Weight for Age, Gm.	Gross Deformities	Location of Sclerosis: Left Ventricle	Left Atrium	Right Ventricle	Right Atrium	Valves	Myocardium	Vascu. Periv.
1	7½ mo.	93	34	.....	+	..	..	..	.....	..	..
2	2½ yr.	145	57.5	.....	..	+	..	..	.....	..	..
3	9 mo.	90	37	.....	+	+	..	+	.....	+	..
4	17 mo.	137	50	.....	+	+	..	..	.....	..	..
5	6 wk.	65	21	Dilated pulmonary artery	+	+	+	..	.....	+	..
6	3 mo.	75	23	Patent ductus; coaretation of aorta; bicuspid aortic valve	+	+	..	..	.....	+	..
7	5½ mo.	71	30	Patent ductus and foramen ovale	+	+	..	..	.....	..	+
8	7½ mo.	..	..	.....	+	..	..	..	.....	..	..
9	14½ mo.	90	46	.....	+	+	..	..	.....	+	..
10	7 mo.	92	34	.....	+	+	..	..	.....	..	..
11	7 mo.	78	34	Patent ductus	+	+	..	..	Slight thickening of cusps of aortic and mitral valves	..	..
12	2 yr.	70	56	.....	+	+	+	..	.....	..	..
13	5 min.	37	17	.....	+	..	+	..	.....	+	..
14	2½ mo.	34 (fixed)	23	Coaretation of aorta; bicuspid aortic valve	+	+	+	+	.....	+	..
15	18 mo.	137	52	.....	+	+	..	..	.....	+	..
16	11½ yr.	475	122	.....	+	+	+	+	.....	+	..
17	6 hr.	45	17	.....	+	+	..	..	Aortic and mitral valves stenotic; cusps thickened	+	..
18	6 wk.	65	21	Patent ductus	+	+	..	..	Aortic valve stenotic; cusps thick, fused	..	..
19	8 mo.	230	37	Bicuspid aortic valve	+	+	..	..	Aortic valve, 2 thickened cusps	+	..
20	4½ mo.	58	29	Patent ductus; small left ventricle	+	+	..	..	Aortic bicuspid; stenotic mitral	+	..
21	3 mo.	..	..	.....	+	+	..	..	Aortic bicuspid; stenotic	..	..
22	7½ mo.	90	34	.....	+	+	..	..	Mitral valve swollen; contained several nodules	+	..
23	15 mo.	100	48	.....	+	+	..	..	Mitral valve stenotic; cusps thickened; aortic and pulmonic valves slightly thickened	..	..
24	28 mo.	98	56	.....	+	+	+	..	.....	..	..
25	16 mo.	130	48	.....	+	+	..	..	Mitral valve thick rigid; one leaflet short and fused; tricuspid valve contained nodules	+	..

respiratory rate at birth, and breathing became more rapid and labored at 6 weeks of age. Cyanosis was observed at this time, and the liver margin extended 3 fingerbreadths below the right costal margin. The heart was enlarged both to the right and to the left, and a blowing systolic murmur was heard at the apex. Roentgenologic studies revealed a markedly enlarged globular-shaped heart. Electrocardiograms were not remarkable except for slight widening of the QRS complex in Leads II and III, sinus tachycardia, and right axis deviation. The cyanosis cleared with the administration of oxygen, but dyspnea persisted. The child was admitted to the hospital on several occasions with infections of the upper respiratory tract, fever, and severe dyspnea and cyanosis. Prior to the last admission she became irritable, restless, and febrile, and survived only 11 hours after hospitalization.

At autopsy the heart weighed 93 gm. (average, 34 gm.). The ventricles and right atrium were dilated. The left ventricle measured 7 to 10 mm. in thickness; the right, 4 to 5 mm. The endocardium of the left ventricle was thick, grayish white, and opaque. The trabeculae carneae and papillary muscles of the left ventricle were greatly flattened.

CASE 2.—W. W., a white boy, 2½ years old, was admitted to the hospital with a history of having been slightly cyanotic since birth but having had no other symptoms until the age of 3 months, when he "stopped growing and began to fall away." Dyspnea and cyanosis persisted, and the child was orthopneic. He appeared markedly undernourished and poorly developed, pale, cyanotic, and wet with perspiration. The respiratory rate was 80 per minute, the pulse rate 200 per minute, and the blood pressure 100/40 mm. of mercury. The heart was enlarged to the left, and rales were heard throughout both lung fields. No murmurs were heard. The liver margin was palpable at the level of the umbilicus. The face and extremities were edematous. Oxygen was given and rapid digitalization attempted, but death occurred about 10 hours after admission.

At autopsy the heart weighed 145 gm. (average, 57.5 gm.). All chambers were dilated, the right ventricle more than the left. The ventricular walls were hypertrophic, the left measuring 9 to 10 mm. in thickness, the right 4 to 7 mm. Endocardial thickening was not conspicuous grossly but was evident in the left atrium on microscopic examination. In addition, there was evidence of inactive tuberculosis of several bronchial lymph nodes. No other lesions were found, and the cardiac disease seemed to be the most probable cause of death.

CASE 3.—D. T., a white girl, 9 months old, was said to have had pneumonia at the age of 7 months and another attack two to three weeks before admission. Two days before admission, severe dyspnea and cyanosis developed, and the child died a few moments after admission to the hospital.

At autopsy the heart weighed 90 gm. (average, 37 gm.). The left ventricle was greatly dilated and hypertrophied. The wall measured 8 to 9 mm. in thickness. The right atrium and ventricle were moderately dilated, and the wall of the latter was 3 to 4 mm. thick. The endocardium of the left atrium, left ventricle, right atrium, and interatrial septum was thick, white, and opaque. The thickened tissue was made up of fibroelastic fibers, some of which extended into the muscle of the left ventricle. The muscle tissue here was vacuolated and contained fat.

CASE 4.—T. W., a white boy, 17 months old, was admitted to the hospital with a history of having been well until six days previously, when he became tired and lost his appetite. Two days prior to admission his ankles and eyelids became puffy. A sibling had died at the age of 2 days of heart disease. On admission the child appeared to be well developed and well nourished but pale. There was slight edema of the face and lower extremities. The heart was normal except for a rapid rate. The hemoglobin level was 7.7 gm. per 100 cc, the red blood cell count 4,660,000, and the white cell count 17,600, with a normal distribution of cells. The urine was normal. After a period of rest in bed, the edema subsided. Three days later 150 cc. of whole blood was given and on the following day 50 cc. more. Immediately after the second transfusion, the child became cyanotic and rales developed in both lung fields. A teleoroentgenogram revealed an enlarged globular heart, measuring 11 cm. in diameter, in a chest 16.2 cm. in diameter. The electrocardiogram was normal except that the T wave in Lead I was rounded and inverted in Lead III. With digitalization, oxygen inhalation, and sedation he improved, but six days later his temperature rose to 104 F. and a severe cough developed, and he became more dyspneic, and finally died on the 25th hospital day.

At postmortem examination multiple infarcts of the lungs, kidneys, and spleen were found in addition to the cardiac disease. The heart weighed 137 gm. (average, 50 gm.). The left ventricle was greatly dilated, the right atrium and ventricle less so. The wall of the left ventricle measured 8 mm. in thickness, and that of the right 5 mm. The endocardium of the left ventricle and atrium was thick, white, and opaque. The trabeculae carneae and papillary muscles of the left ventricle were flattened, and numerous dark red thrombi were adherent to the endocardium and enmeshed in the trabeculae. There were areas of hydropic degeneration and fibrosis in the myocardium just below the endocardial surface. Focal miliary areas of degeneration were scattered throughout the myocardium.

CASE 5.—S. S., a white girl, 6 weeks of age, was said to have been well until five days prior to admission, when she became restless and refused to eat. She vomited several times and coughed frequently. There was no fever. She appeared well nourished, but pale, irritable, and acutely ill. Her respiratory movements were rapid, shallow, and labored. There was no cyanosis. The heart rate was rapid, but the rhythm was regular and there were no murmurs. Her entire left chest was dull to percussion, and roentgenograms showed an enormously enlarged heart, which reached the lateral wall of the chest on the left. Marked dyspnea continued, but there was never any cyanosis. About nine hours after admission, the child suddenly stopped breathing.

At autopsy the heart weighed 65 gm. (average, 21 gm.). The right atrium and both ventricles were greatly dilated. The thickness of the left ventricular wall was 6 mm. and of the right 3 mm. The ductus arteriosus was patent. The pulmonary artery was dilated beyond the valvular area and short, dividing almost immediately into right and left branches. Thickness and opacity of the endocardium were most evident in the left ventricle, less so in the left atrium, and were distributed in spotty fashion in the right ventricle. Beneath the endocardium, the myocardium showed evidence of degeneration and fibrosis.

CASE 6.—D. H., a white girl, 3 months of age, had been vomiting for three days but did not appear ill until the day prior to admission to the hospital, when she vomited all of her feedings. Since the age of one month, she had breathed rapidly. On the day before admission, she turned blue and began to cough and wheeze, with retraction of the chest well. The birth and family histories were normal. Examination revealed a poorly nourished pale cyanotic infant who was extremely ill. The temperature was 103.8 F.; the cardiac rate was greater than 200 per minute, and the respiratory rate was 90 per minute. The heart was markedly enlarged, but no murmurs were heard. The liver edge was palpable 3 fingerbreadths below the right costal margin. A teleoroentgenogram revealed a heart markedly enlarged both to the right and to the left, the total transverse diameter measuring 9 cm. and the thorax 11.5 cm. Increased pulmonary markings were suggestive of congestion. In the electrocardiogram there was an inversion of the T waves in Leads II and III. A blood culture made at the time of admission contained a coagulase-positive hemolytic Staphylococcus albus. Two hours after admission, despite oxygen and other symptomatic therapy, the child died.

At autopsy the heart weighed 75 gm. (average, 23 gm.). The left ventricle was markedly dilated, the right ventricle and atrium less so. The wall of the left ventricle measured 9 mm., and that of the right 4 mm. The ductus arteriosus was patent, and there was coarctation of the aorta distal to the origin of the left subclavian artery. The aortic valve had only two cusps. The thick opaque endocardium extended throughout the left atrium and ventricle, and the columnae carneae were very flat. In the myocardium of both ventricles, but especially the left, were areas of hydropic degeneration and fibrosis.

CASE 7.—C. M., a white girl, 5½ months old, was considered to be in good health until seven days prior to admission, when she contracted a cold. Two days before admission, she refused her feedings, began breathing rapidly, vomited twice, and had several loose stools. On the day of admission, she started to cough and to cry "as if in pain." Examination revealed a desperately ill, poorly nourished child with pale skin discolored by a bluish mottling. The rectal temperature was 108.6 F. The respiratory movements were very rapid and shallow and were accompanied by an expiratory grunt. Coarse rhonchi could be heard throughout both lung fields. The heart rate was rapid, and the sounds were of poor quality. The child was sponged and her temperature reduced, but 25 minutes later her heart action suddenly ceased.

At autopsy the heart weighed 71 gm. (average, 30 gm.). The right and left ventricles and left atrium were dilated. The left ventricular wall measured 6 to 9 mm. and the right 6 mm.

An opening in the anterior portion of the foramen ovale measured 5 mm. in diameter. The ductus arteriosus was patent. The endocardium of the left atrium was thick and white. There were areas of thickened endocardium in the left ventricle, with subendocardial degeneration and miliary infarcts in the muscle. Slight coronary arteriosclerosis was noted.

CASE 8.—C. G., a Negro girl, 7½ months of age, had been under observation at regular intervals since birth. The mother, who had an uneventful pregnancy, had had syphilis three years previously but had been treated and now had a negative serologic reaction. The infant had been hospitalized at the age of 4 months because of diarrhea of two days' duration. At that time the heart had a bigeminal rhythm but was otherwise normal, on both clinical and roentgenological examination. After several days the child was discharged as well. One month prior to the present admission, swelling of the face, hands, and feet and a rapid respiratory rate developed. When symptoms of dyspnea and cough occurred, she was brought to the hospital. There she appeared acutely ill and cyanotic. The veins of her neck were engorged. The heart was markedly enlarged to the left and to the right. It was beating rapidly, but no murmurs were heard. The liver margin was palpable at the level of the umbilicus. Serial electrocardiograms revealed almost complete auriculoventricular dissociation. Numerous premature ventricular beats arising from various foci occurred in paroxysms. Roentgenograms of the heart showed great enlargement, with the transverse diameter 8.5 cm. in a chest 13.5 cm. wide. Despite digitalization, oxygen, and supportive therapy, the child died two weeks after admission.

At autopsy the heart was found to be large (not weighed). There was marked thickening of the endocardium of the left ventricle, and a few mural thrombi were present in the right ventricle. Beneath the endocardial layers the myocardium of the left ventricle contained focal areas of degeneration, with vacuolation of the muscle fibers and replacement with fibrous tissue.

CASE 9.—B. W., a white girl, 14½ months old, was admitted to the hospital with a history of cough, dyspnea, and frequent vomiting, beginning eight months previously. A routine chest film, made shortly after birth, demonstrated "an enlarged thymus," which was irradiated. At the age of 6½ months, the child had a febrile illness diagnosed as bronchopneumonia. The pneumonia responded to treatment, but she continued to cough, occasionally vomited, and had some dyspnea. A roentgenogram revealed an enlarged heart. She was digitalized for a period of a month, with relief from the cough and vomiting and decrease in the size of the heart. One month before admission, the cough and vomiting recurred, together with edema of the face, hands, and feet. The child appeared well developed but pale. Her respirations were rapid and labored. The heart was markedly enlarged to the left. A systolic murmur was heard at the apex. The liver margin was palpable 3 cm. below the right costal margin. A roentgenogram of the chest showed a large globular-shaped heart. Digitalization was resumed, and the next day a small transfusion of whole blood was given. On the second day after admission, after a second transfusion of whole blood the child became cyanotic, her respirations became more rapid and labored and shortly thereafter she died.

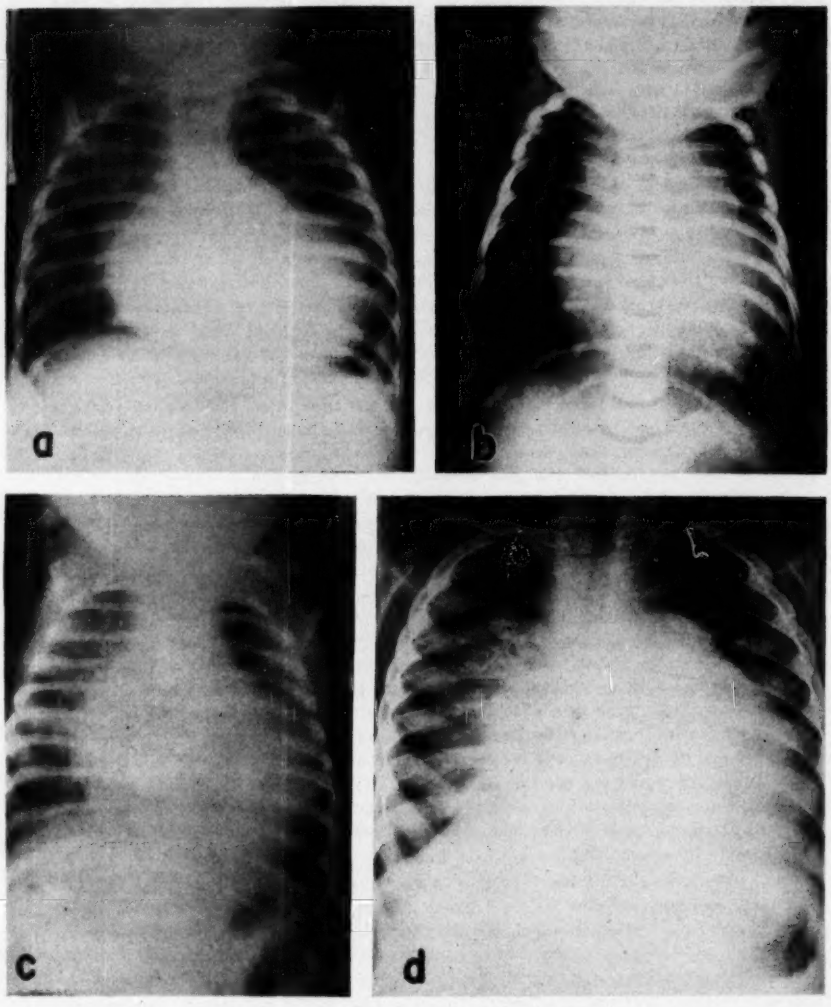
At autopsy the heart weighed 90 gm. (average, 46 gm.). All chamber walls were hypertrophied. The left ventricular wall measured 6 mm. in thickness and the right 4 mm. The endocardium of the left atrium and ventricle was thickened and white. The fibrous tissue was deposited heavily on the trabeculae and chorda tendineae and extended slightly into the subendocardial layers of myocardium.

CASE 10.—B. S., a white boy, 7 months of age, was admitted to the hospital with a history of refusing food and vomiting for the previous 12 hours. Five days before he had had a mild diarrhea and an ear infection which lasted only 48 hours. Otherwise, he had always been in good health and had been followed at monthly intervals in the outpatient clinic. He appeared to be well developed and well nourished but pale and listless. He breathed rapidly and grunted with each breath. There was no cyanosis. The heart rate was 160 per minute. No murmurs were heard. The liver edge was palpable two fingerbreadths below the right costal margin. Fluids were given subcutaneously but two hours later, before any further therapy was started, he suddenly died.

At autopsy the heart weighed 92 gm. (average, 34 gm.). The endocardium of the left atrium and ventricle was markedly thickened, yellowish gray, and opaque. The myocardium was normal.

CASE 11.—S. W., a white girl, 7 months of age, was apparently in excellent health until the day prior to admission, when she vomited, became dyspneic, and cried as if in pain. On the day of

admission she became cyanotic and was in obvious respiratory distress. Her temperature was 103 F. The heart was enlarged to the left, and the rate was rapid. No murmurs were heard. The liver edge was palpable at the iliac crest. In roentgenograms the heart appeared markedly enlarged and globular. The infant was placed in an oxygen tent and digitalization started, but death occurred four hours later.



Roentgenograms illustrating the cardiac enlargement: (*a*) Case 1; (*b*) Case 5; (*c*) Case 6, and (*d*) Case 9.

At autopsy the heart weighed 78 gm. (average, 34 gm.). All chambers were dilated, and the ductus arteriosus was patent. The left ventricular wall measured 8 mm. and the right 3.5 mm. The endocardium of the left atrium and ventricle was thick and pale yellow, and there was slight thickening of the cusps of the aortic and mitral valves.

CASE 12.—S. McF., a white boy, 2 years old, had a mediastinal shadow discovered on a routine roentgenogram at birth. The shadow was thought to represent an enlarged thymus, but it persisted after irradiation. At 5 weeks of age, he had projectile vomiting, which responded to the administration of atropine and thick feedings. His mother thought that he had had a "dusky blue" color since birth. Otherwise, he seemed to be well until 15 months of age, when he became dyspneic and a rapid heart rate and edema of face, feet, hands, and abdomen developed. The liver edge was 4 cm. below the costal margin. A roentgenogram of the chest at this time revealed a large globular heart 9.3 cm. in width in a chest of 15.3 cm. An electrocardiogram taken at the same time showed flat T waves in all limb leads and right axis deviation. With the administration of digitalis and mercurial diuretics, he lost much of his edema and seemed less dyspneic. Although maintained on digitalis, he had repeated bouts of cardiac failure, the dyspnea and edema became more marked, and definite cyanotic attacks were observed. At the age of 18 months, a systolic murmur was heard for the first time over the apex of the heart. He died at the age of 2 years.

At autopsy the heart weighed 70 gm. (average, 56 gm.). Both ventricles and the left atrium were dilated. The left ventricular wall was 8 mm. thick and that of the right was 4 mm. thick. The endocardium of the left ventricle, left atrium, and interventricular septum was grossly thick, white, and opaque. To a less extent, the right ventricular wall was involved. There was no invasion of the myocardium by the fibroelastic tissue.

CASE 13.—B. B. A., a Negro boy, born at term, was born by a breech delivery with forceps application to the head. Respiratory movements were shallow and irregular, and the infant was cyanotic. He died five minutes after birth.

Postmortem examination revealed a tear in the anterior portion of the tentorium, with subdural hemorrhage. The lungs were poorly expanded. The heart weighed 37 gm. (average, 17 gm.). Both ventricles were dilated. The foramen ovale and ductus arteriosus were patent. Both the left and the right ventricular wall measured 5 mm. in thickness; the right ventricles were dilated. Fibroelastic tissue of a grayish-white color was distributed in areas of varying thickness over the endocardium of both ventricles but was thicker on the right. The muscle tissue was hypertrophied and contained areas of necrosis of various sizes. The connective tissue surrounding medium-sized blood vessels was slightly increased in amount.

CASE 14.—A. C. G., a white girl, 1½ months of age, had had symptoms of dyspnea and pallor since birth. The symptoms became worse with exertion, such as nursing at the breast. At the age of 2 weeks, a roentgenogram of the chest revealed "an enlarged thymus and heart." The thymus was irradiated, and the infant was thought to be somewhat improved, although dyspnea and pallor persisted. At the age of 2 months, dyspnea became more marked, and on the day of admission the child became cyanotic. The heart rate was rapid. No murmurs were heard. The liver edge was palpable 2 cm. below the right costal margin. There was very little improvement following the administration of oxygen and digitalis, and the infant died nine hours after admission.

At autopsy the heart weighed 34 gm. (fixed). The average weight of the fresh specimen at this age is 23 gm. There was coarctation of the aorta at the site of origin of the left subclavian artery, and the aortic valve was bicuspid. The endocardium of all the chambers, especially the right atrium, was thickened. The ventricular septal walls were greatly thickened, and there was an increase in the interstitial connective tissue of the muscular layers.

CASE 15.—J. C., a white girl, 18 months of age, was apparently well until she was 16 months old, when she began to vomit, refuse food, and breathe rapidly. The pulse rate was rapid and the heart was large, but there were no murmurs. The roentgenograms showed that the heart had a large globular configuration and a width of 10.5 cm. in a chest of 16.3 cm. The liver edge was palpable at the crest of the ilium. An electrocardiogram showed a flat or inverted T wave in Lead I and a low T wave in Lead II. The Q wave in Lead III was prominent, and there was a right axis deviation. Digitalis seemed to help the patient at first, but symptoms of dyspnea, anorexia, and vomiting recurred over a period of two months, at the end of which time she grew worse, became cyanotic, and suddenly died.

At autopsy, the heart weighed 137 gm. (average, 52 gm.). The left ventricular wall measured 8 mm. and the right 4 mm. Thick endocardial fibrosis occurred in the left atrium and left ventricle, with a slight extension of the process into subendocardial layers of the myocardium.

CASE 16.—M. M., a Negro girl, 11½ years of age, began to have fever and experienced sharp pain in the precordial area and dull aching in the epigastrium. "Heart trouble" was said to have been the cause of death of the patient's father and two siblings and was a chronic disorder of two other living siblings. The patient remained in bed at home, received sulfadiazine and digitalis, and made some improvement, but the pain recurred in milder degree, and fatigue and tachycardia followed. On admission to the hospital, she seemed well nourished but had slight edema of the abdominal wall and legs, an enlarged heart, a pulse rate of 150 to 180 per minute, and a liver enlarged to 4 cm. below the costal margin. There were no murmurs. The blood counts, hemoglobin, and erythrocytic sedimentation rates were normal. The electrocardiogram showed a P-R interval of 0.22 to 0.28 second. Attacks of dyspnea, edema, tachycardia, and finally cyanosis and hemoptysis recurred until she was readmitted to the hospital. Just before death the electrocardiogram showed left bundle-branch block.

The weight of the heart at autopsy was 475 gm. (average, 122 gm.). Both ventricles were greatly dilated. The wall of the left ventricle was 13 mm. thick, that of the right 5 mm. Fibroelastic tissue covered the endocardium of all chambers, most extensively that of the left atrium, and invaded the muscle tissue. The myocardial fibers were hypertrophied, and the intimal layers of one coronary artery were thickened. There was an organized mural thrombus in each ventricle.

CASE 17.—P. Mc., a white male infant, was born prematurely at home and never breathed well nor attained good color. He was admitted to the hospital two hours after birth, with a slow irregular respiratory rhythm and deep cyanosis. His heart rate was very slow and heart sounds barely audible. A roentgenogram of the chest revealed incompletely expanded lungs and an enlarged heart. Stimulants and oxygen were administered with some improvement in respiration, but the cyanosis persisted, and death occurred four hours after admission at the age of 6 hours.

At autopsy the heart weighed 45 gm. (average, 17 gm.). The ductus arteriosus and foramen ovale were still open. The left ventricle was greatly dilated. Its wall measured 5 mm. in thickness and that of the right ventricle 3 mm. Fibroelastic tissue covered the endocardial surface of the left ventricle, left atrium, and the mitral and aortic valves. The valves were stenotic and their cusps were thickened. The trabeculae carneae were small, occasionally adherent, and the papillary muscles were small. There were areas of degeneration and calcification in the myocardium of the left ventricle.

CASE 18.—D. L. D., a white boy, 6 weeks old, was admitted to the hospital with symptoms of fretfulness, cough, and rapid respiratory rate of of two days' duration. He appeared acutely ill, pale, and slightly cyanotic. His rectal temperature was 102 F. The cardiac rate was 200 per minute. No murmurs were heard. Harsh breath sounds and rales occurred at the bases of both lungs; the liver edge was palpable 3 fingerbreadths below the right costal margin and the spleen 1 fingerbreadth below the left margin. The blood was sterile on culture. The patient was placed in an oxygen tent and given penicillin. He died 12 hours after admission without showing evidence of improvement.

At autopsy the weight of the heart was 65 gm. (average, 21 gm.). The ductus arteriosus was patent; the left atrium was slightly dilated and the right markedly so. The aortic valve was stenotic; its cusps were thickened and fused at the commissures so that the orifice was reduced to about 50% of normal size. The thick opaque endocardium was most evident in the left atrium and less so in the left ventricle. The papillary muscles were small and spotted with yellow streaks. The microscopic examination was not recorded.

CASE 19.—D. Mc., a white boy, 6 months old, manifested fretfulness, crying, cough, and occasional vomiting three weeks before admission to the hospital. His breathing was labored and the rate rapid, but there was no cyanosis. His condition improved somewhat, but two days prior to admission to the hospital the symptoms recurred with severity. The patient was thin, pale, and dyspneic. The heart rate was 210 per minute. No murmurs were heard. The liver edge was palpable 3 fingerbreadths below the right costal margin. A roentgenogram of the heart demonstrated extreme enlargement both to the right and to the left, measuring 11 cm. in diameter in a chest of 15 cm. An electrocardiogram showed right axis deviation and auricular tachycardia. The child was placed in an oxygen tent, given penicillin and digitalis, and improved rapidly. On the day before discharge the heart rate fell to 120 per minute and a loud systolic murmur became audible along the left sternal margin and over the aortic area. Six weeks

later, when the patient was 8 months of age, the same symptoms of cardiac failure recurred. The patient became cyanotic and comatose and died 24 hours later.

The weight of the heart at autopsy was 230 gm. (average, 37 gm.). The left ventricle was greatly dilated, and the thickness of the wall was 11 to 15 mm. The right wall was 5 to 6 mm. thick. The aortic valve had two cusps, which were covered with fibrous tissue to produce some degree of stenosis. The fibrous tissue also involved the endocardium of the left atrium, left ventricle, and papillary muscles and extended into the underlying myocardial muscle. In the myocardium and papillary muscles of the mitral valve were areas of focal degeneration and necrosis.

CASE 20.—C. H., a white girl, 4½ months old, had been cyanotic since birth. Two days prior to admission she began to cough, became fretful, refused to eat, and had a slight fever. On admission she appeared acutely ill, irritable, and cyanotic. Her respiratory movements were rapid and shallow. Her temperature was 103 F. The breath sounds were loud and harsh, and a few fine rales were heard in the right axilla. The heart was enlarged to the left; it was beating at a rate of 200 per minute. A loud systolic murmur was audible at the base of the heart. The liver was enlarged. A teleoroentgenogram made on admission revealed a markedly enlarged globular heart and some pneumonic infiltrate in the right hilar region. The hemoglobin level was 20.2 gm. per 100 cc.; the white cell count was 7,400. A blood culture was negative. The infant was placed in an oxygen tent, and within 24 hours her fever had subsided and she seemed much improved. With the slowing of the heart rate, a systolic and diastolic murmur could be heard along the left sternal margin in the third intercostal space, and a thrill was palpable over the same area. Eight days later the symptoms of cardiac failure recurred, the baby's temperature rose to 104 F., and she died within 24 hours.

At autopsy the heart weighed 58 gm. (average, 29 gm.). The left atrium was huge and the left ventricle small but thick-walled, the wall varying in width from 5 to 12 mm. The wall of the right ventricle was 4 mm. thick. The ductus arteriosus was widely patent. The aortic valve was bicuspid and markedly stenotic. The leaflets of the mitral valve were thick and firm and produced a small "buttonhole" orifice. The chordae tendineae of this valve were thick and short. Friable vegetations were attached to the anterior leaflet. Thickening of the endocardium was greatest in the left atrium and spotty in the left ventricle. The myocardium contained areas of degeneration and fibrosis. A slight degree of coronary endarteritis was observed.

CASE 21.—B. P., a white boy, 3 months of age, had had a loud precordial systolic murmur at birth. He was said to have been cyanotic for the first two days, but a roentgenogram of the chest taken thereafter was normal. The murmur persisted. At one month of age, the patient was noted to breathe rapidly for short periods, but because he ate well and gained weight the parents were not alarmed. Two days before death the infant vomited, and had a few loose stools and a continuously rapid respiratory rate. He died while en route to the hospital.

The heart was not weighed or measured at autopsy. Fibrosis of the endocardium was extensive in the left atrium and ventricle and was widespread throughout the myocardium. The aortic valve was bicuspid and so thickened that it was stenotic.

CASE 22.—C. B., a Negro girl, 7½ months old, had had a cold and a croupy cough one month before admission to the hospital, with dyspnea, anorexia, and fever for a period of two days. On admission to the hospital, she appeared acutely ill; her breathing was rapid, and there was retraction of the suprasternal notch and of the epigastrium. Her temperature was 104 F. Over the entire left chest, the percussion note was dull and the breath sounds were suppressed. The heart rate was 180 per minute. A systolic murmur was heard at the apex. The liver and spleen were moderately enlarged. A teleoroentgenogram of the chest revealed a homogeneous density which filled the entire left side, displacing the mediastinal structures to the right. Oxygen was administered, but the infant died one hour after admission to the hospital.

The heart weighed 90 gm. (average, 34 gm.), and all the chambers were dilated and the walls hypertrophied. All valvular orifices were dilated. The free border of the mitral valve was swollen and contained several small nodules, measuring about 1 mm. in diameter. Endocardial fibrosis was limited to the left atrium and left ventricle. At the apex of the left ventricle and in the papillary muscles were areas of acute myocarditis.

CASE 23.—S. I., a white girl, 16 months old, was admitted to the hospital with a history of a rapid grunting type of respiration, fretfulness, and profuse perspiration of one week's duration.

There had been no temperature elevation. The past history was noncontributory, except that shortly after birth a routine chest film had shown an "enlarged thymus." Radiation therapy was given. On admission the patient appeared to be well nourished but was irritable, perspired profusely, and breathed rapidly. There was no cyanosis and no cardiac murmur. The liver edge was palpable 2 fingerbreadths below the right costal margin. A roentgenogram of the chest revealed "marked infiltration throughout both lung fields, suggestive of bronchopneumonia." The urine was normal. The child seemed to improve with penicillin therapy. The day after admission slight edema of the face, hands, and lower extremities developed. She remained in the hospital for six days and was sent home with only a little edema of the feet remaining. The day after discharge she returned to the hospital in a moribund condition, with rapid labored breathing and marked cyanosis, and died in a few hours. A roentgenogram of the chest obtained before death revealed an enlarged globular heart.

The heart at autopsy weighed 100 gm. (average, 48 gm.). The muscle appeared hypertrophic, the wall of the left ventricle measuring 6 mm. in thickness and that of the right 3 mm. The mitral valve was stenotic, and the cusps and chordae tendineae were greatly thickened. There was thickening of the aortic and pulmonic valves. The fibroblastic tissue also covered the endocardial surface of the left atrium and left ventricle.

Case 24.—K. G., a white girl, 28 months of age, manifested dyspnea, anorexia, and edema of the face, hands, and feet. Her heart beat was rapid, but no murmurs were heard. The liver was palpable 3 cm. below the right costal margin. On repeated examinations the urine was normal. A roentgenogram of the chest revealed an enlarged heart with a cardiothoracic ratio of 8.5 cm. to 14 cm. An electrocardiogram showed sinus tachycardia, right axis deviation, a low T wave in Lead I and an isoelectric T wave in Leads II and III. The child was digitalized, with marked improvement and relief from symptoms. In the ensuing year she was kept on digitoxin but, in spite of good home care, was rehospitalized on eight occasions because of vomiting, coughing, dyspnea, and other signs of cardiac failure. With the aid of diuretics and the regulation of the dosage of digitoxin, she responded favorably for a short time. Her heart continued to enlarge. At times a gallop rhythm could be heard. At the final admission, 13 months after the onset of symptoms, signs of congestive failure and deep cyanosis were present. Therapy, which included administration of diuretics and digitoxin, failed to give relief, and she died. Roentgenograms of the heart made on the day of death revealed a cardiac diameter of 10 cm. in a chest of 15.5 cm.

At autopsy the heart weighed 98 gm. (average, 56 gm.). All chambers were dilated, and the left ventricular wall measured 10 mm. in thickness and the right 6 mm. The posterior cusp of the mitral valve was slightly thickened, and the chordae tendineae attached to this cusp were short and fused. The valvular orifice was not diminished in size. The fibroelastic tissue involved the endocardium of the left atrium and left ventricle and to a less extent that of the right ventricle. The muscle fibers were hypertrophic but not invaded by fibrous tissue. Two antemortem thrombi were adherent to the wall of the right ventricle.

Case 25.—C. T., a white boy, 16 months of age, was admitted to the hospital for the last time with a history of repeated attacks of vomiting, dyspnea, and congestive heart failure during the preceding eight months. At the time of the first admission, when he was 8 months old, the patient appeared pale, cold, and cyanotic. The heart was greatly enlarged, and a soft systolic murmur was heard at the apex. The liver edge was palpable 6 cm. below the right costal margin. A roentgenogram of the chest revealed a tremendously enlarged heart of globular shape. An electrocardiogram showed low T waves in Leads I and II. The child was digitalized and seemed much improved the next day. The heart rate remained rapid, but the liver receded in size. Two pericardial taps were done, but no fluid was obtained. The child was rehospitalized on three different occasions because of his cough, dyspnea, edema, and other signs of congestive failure. He was maintained on digitoxin during periods when he was not in the hospital, but his downhill progress was not checked. On the final admission, at the age of 16 months, he had cyanosis, dyspnea, and fine rales in both lung fields. The heart was markedly enlarged. A loud blowing systolic murmur was audible at the apex. Both the liver and the spleen were enlarged. The child died suddenly eight hours after admission.

At autopsy the heart weighed 130 gm. (average, 48 gm.). All chambers were dilated and the walls hypertrophied. The left ventricular wall measured 7 to 8 mm. in thickness and the

right 4 mm. The endocardium of both left ventricle and atrium was thick, white, and opaque. A soft pink elevated area measuring 1.1 by 1.7 cm. was seen on the endocardium surface of the left atrium. The cusps of the mitral valve were thick, opaque, and rigid, and the chordae tendineae of one leaflet were short and fused. On the free edges of the tricuspid leaflets were three pink nodules about 1 mm. in diameter. The fibroelastic tissue had invaded the myocardium and had replaced the muscle fibers in some areas. There was collagenous degeneration of the cusp of the mitral valve (Tables 3 and 4).

COMMENT

Although a diagnosis of endocardial sclerosis cannot be established with certainty before death, there are features suggestive of the disease. The clinical symptoms exhibited by such patients fall into two fairly distinctive patterns. The first is the young infant, usually less than 6 months of age, who has been in apparent good health until he suddenly has symptoms of severe dyspnea, cough, vomiting, and tachycardia. The heart is very large in most instances.

The other type of patient has somewhat similar symptoms but of milder degree and exhibits periods of remission and apparent improvement. At some time during the first two years of life, he may manifest mild dyspnea, with refusal of food, failure to gain weight, and symptoms of pulmonary infection. The heart is large, but murmurs are usually absent. Episodes of failure recur, and finally the patient dies in much the same manner as do those of the first group.

It is not known whether some patients with mild degrees of endocardial sclerosis ever experience an arrest of the process and survive for many years. One of our patients who died of endocardial sclerosis had a sibling with severe myocarditis of obscure origin, who spent several years in the hospital and convalescent home but made what seemed to be a complete recovery. The Negro girl of 5 years, reported by Peale and Luchesi,[4] died of measles encephalitis, and one of the incidental findings at autopsy was endocardial sclerosis of the left ventricle and auricle.

Differential Diagnosis.—In the early stages of the illness, the symptoms of severe dyspnea and circulatory collapse have suggested pneumonia, nephritis, severe acidosis, salicylism, and the accidental ingestion of poisons. In a few instances when attention became focused on the heart, the diagnosis of pericarditis with effusion could not be eliminated until several nonproductive taps of the pericardial space had been performed. Pressure of the heart on a bronchus produced atelectasis of a portion of the lung in one patient.

Among the congenital malformations of the great vessels producing cardiac enlargement without murmurs or cyanosis are coarctation of the aorta and anomalous origin of the left coronary artery from the pulmonary artery. Endocardial sclerosis has occurred frequently in association with the latter condition and rarely in association with coarctation. In such cases the electrocardiogram has not furnished adequate diagnostic aid. Infants who are cyanotic and have large hearts but no murmurs may have transposition of the great vessels or trilocular hearts. It is often difficult to rule out such conditions without angiocardiography or cardiac catheterization, but these are difficult procedures to carry out in young infants with severe cardiac decompensation. Other causes of cardiac enlargement, such as

4. Peale, A. R., and Lucchesi, P. F.: Report of a Case of Measles Encephalitis Complicated by So-Called "Fetal Endocarditis" and Gonorrheal Pyosalpinx, Am. J. Clin. Path. **12**:357, 1942.

glycogen storage disease, thiamin deficiency, and rhabdomyomata, are extremely rare in our experience.

Acquired heart disease, notably rheumatic carditis, was considered to be the cause of the cardiac lesion in the older children until the absence of distinctive murmurs, fever, and other signs of infection made it unlikely. We have observed two patients recently with isolated myocarditis who presented clinical manifestations similar to those produced by endocardial sclerosis. Conversely, in several of the cases reported above the patients had lesions suggestive of interstitial myocarditis.

It is not our purpose here to discuss etiologic factors of endocardial sclerosis but merely to mention the fact that no single cause has yet been established. There seems to be insufficient pathologic evidence that the process is the result of inflammation or infection before or after the birth of the child. A primary defect of the embryo was mentioned as an etiological factor when the occurrence of the disease in siblings (Weinberg and Himelfarb)[1h] was noted. Ullrich [5] had the opportunity of observing the disease among triplets. Two of the three infants were identical, and they both died of endocardial sclerosis. The third, dissimilar infant survived. Ullrich believed that some genetic factor rather than a uterine environmental influence served as the etiologic agent. However, a defective supply of oxygen and other nutrient materials to the heart has been suggested as a causal factor, because the sclerosis occurs frequently in association with anomalies of the left ventricle, aorta, and the coronary arteries.[6] The theories of etiology have been reviewed thoroughly in previous reports.

SUMMARY

The cases of 25 children with endocardial sclerosis whom we have observed over a five-year period have been reviewed in respect to their clinical and pathological manifestations. The symptoms and signs of the disease exhibited by these patients and by 69 others reported in the literature have formed the basis of a clinical evaluation of the disease.

Cardiac enlargement of considerable degree was present in almost every instance. Symptoms of circulatory failure, notably dyspnea, tachycardia, coughing, and vomiting, were common. Murmurs were atypical and inconstant. Cyanosis usually occurred only as a terminal event. Electrocardiography demonstrated no typical consistent diagnostic pattern.

In many infants the symptoms of circulatory failure appeared with suddenness and severity, terminating in death of the patients within a few days. Other infants survived the initial attacks but suffered recurrences until a final episode resulted in death.

There were 18 infants who died during the neonatal period. Death occurred before the age of 2 years in 86, or 91%, of the 94 patients included in this report.

The location of the sclerotic lesions in the heart seemed to have very little influence on the nature of the symptoms, except that patients whose aortic valves were involved seemed to have cyanosis somewhat more frequently and survived for shorter periods than the remainder of the group.

36 Butler St. (Dr. Blumberg).

5. Ullrich, O.: Angeborene Herzhypertrophie mit Endokardfibrose bei zwei eineiigen Partnern von männlichen Drillingen, Ztschr. mensch. Verer. u. Konstitutionslehre **21**:585, 1938.

6. Leary, D. C.; Welt, L. G., and Beckett, R. S.: Infectious Mononucleosis Complicating Pregnancy with Fetal Congenital Anomaly of Infant, Am. J. Obst. & Gynec. **57**:381, 1949.

INEFFECTIVENESS OF CAROB FLOUR IN INFANTILE DIARRHEA

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THERAPEUTIC efforts toward the control of diarrhea have for many years included the use of a vast array of vegetable derivatives containing pectin and lignin. These complex carbohydrate substances have been clearly shown to exert a distinct effect upon the character of the diarrheal stool. This effect upon the appearance and consistency of the stool has been construed to indicate an effect upon the course of the diarrheal disease state. Inasmuch as the chief effects of the latter are fluid and electrolyte loss and a resultant alteration in intra- and extra-cellular fluid balance, an evaluation of the effect of such therapy in diarrhea should be based upon a determination of the degree to which fluid and electrolyte loss is inhibited rather than upon an alteration in the character of the stool. Such an evaluation of a controlled series of 47 cases of etiologically related infantile diarrhea designed to determine the effect of pectin and lignin on the diarrheal disease state is reported herein. Carob flour was selected for this evaluation as it has a high lignin (and pectin) content and has been the subject of several recent studies which supposedly demonstrated its efficacy in diarrhea. This analysis of the course of diarrhea and fluid alteration in alternate untreated and carob-flour-treated patients demonstrates that, despite a distinct effect upon the character of the stools, carob flour exerts no significant effect upon the course of the disease state and the resultant fluid loss.

The material used in this study consists of 47 infant patients with diarrhea who were admitted to the Pediatric Section, William Beaumont Army Hospital, during the period Nov. 1, 1951, to March 1, 1952. All patients less than 20 months of age with diarrhea were admitted to the study, alternate patients being placed in the carob flour ("arobon," Nestlé) treated or in the control group. An epidemic of presumably viral enteritis was epidemic in the community at the time of the study and exhibited a fairly consistent clinical pattern of fever, anorexia or vomiting, severe and prolonged diarrhea, and frequently clinical dehydration in infants. Only patients whose clinical patterns were consistent with this pattern and in whom no pathogenic enteral bacteria or significant parenteral infection could be initially detected were included in the final study. (Several patients with shigellosis and with otitis media and diarrhea, though initially admitted, were subsequently excluded from the study.) Thus probably all patients represent diarrhea of the same origin and, as can be seen from Table 1, patients in the two groups demonstrated essentially the same symptomatology and course of disease.

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Alternate patients admitted to the treated group received boiled skimmed milk with carob flour, with 2 teaspoonfuls to 4 oz. (120 cc.) of milk. Feedings were started as soon as circulatory insufficiency (if any) had been corrected by parenteral fluid administration (by venesection in the majority of severe cases). Water and/or weak tea was given for short periods in a few markedly undernourished infants. No other foods or milk preparations were introduced until diarrhea had ceased or progression necessitated abandonment of oral feedings. Feedings were given at three-hour intervals (if patients were awake) and in quantities desired. Patients admitted to the alternate untreated group were handled in an identical manner except that they received skimmed milk only without carob flour. No medications intended to alter the character of the diarrhea were administered, and no antibiotics were employed (unless specific enteral or parenteral infections were encountered, and then the case was excluded from the final study). Fluids, blood, plasma, vitamins, sodium, potassium, and chloride were administered parenterally as required to correct initial deficits and control continuing losses. Potassium chloride subcutaneously or intravenously was administered in all cases in

TABLE 1.—*Comparability of the Treated and Untreated Groups*

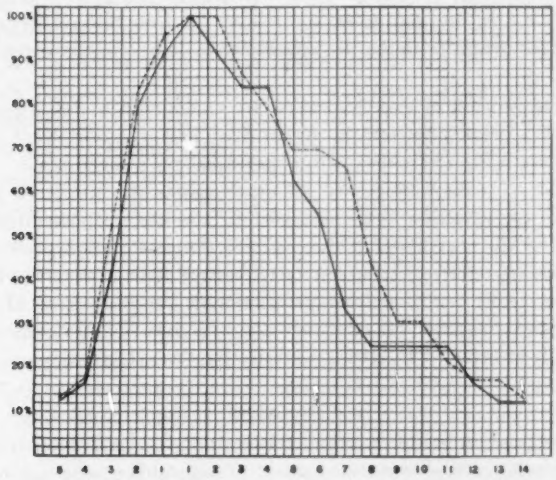
	Control	Carob-Flour Treated
Number of patients	24	23
Age, average, months	7.9	6.5
Sex		
Male	67%	52%
Female	33%	48%
Severity		
Parenteral fluids used	58%	52%
Clinical dehydration	50%	48%
Vomiting	58%	52%
Fever greater than 101 F.	54%	56%
Duration, average, days		
Diarrhea before therapy	3.0	2.8
Diarrhea after therapy	7.5	7.9

which parenteral administration of fluid was considered necessary in dosages approximating 0.22 gm. of potassium chloride per kilogram of body weight per 24 hours. Stool cultures for predominating organism (rectal swab technique chiefly) were obtained twice on admission and approximately every five days thereafter. A daily record of the character and degree of diarrhea, vomiting, anorexia, and dehydration and of the weight, temperature, general appearance, and quantity of fluids administered parenterally was made on special record forms prepared for this purpose. The same observer made all the observations on all patients to insure uniform appraisal.

Table 1 demonstrates the comparability of the treated and untreated groups. The only significant difference appears in the sex distribution. The character and severity of the disease process as measured by the incidence of dehydration, fever, vomiting, and the need for parenteral fluids is almost identical in the two groups. Dehydration was considered to be present when a distinct alteration in tissue turgor was detected, fever when a temperature greater than 101 F. appeared at any time during the course of the illness, and vomiting when this symptom was a definite part of the disease state appearing on at least two different days; parenteral fluid therapy was recorded when such therapy was administered to correct an obvious fluid deficit. No significant difference in the average duration of diarrhea prior

to or after the initiation of therapy is apparent. The time of initiation of therapy was the time at which skimmed milk or skimmed milk with feedings were commenced, and the duration of diarrhea was the number of 24-hour periods prior to or after the initiation of therapy during which diarrhea was detected. Diarrhea was considered to be present when the total water content of the day's stool was distinctly in excess of normal as judged by observation of the soiled diapers.

Evaluation of the effect of the carob flour was accomplished by analysis of the course of the diarrhea and its concomitant effects on body fluids as indicated in the special record forms. (No analysis of the records was attempted until the enteritis epidemic had subsided and the series was considered closed.) Inasmuch as the chief danger in diarrhea (except for moderate discomfort and inconvenience to child and mother, the only danger in diarrhea) is the alteration in body fluid and electrolyte balance, an evaluation of the presence of clinical dehydration, of the



Course of diarrhea in the treated and untreated groups. Ordinate, percentage of patients demonstrating diarrhea; abscissa, number of days prior to and subsequent to the initiation of therapy. The broken line indicates values for the treated group; the solid line, for the untreated group.

TABLE 2.—*Response of the Treated and Untreated Groups as Judged by Duration of Parenteral Fluid Therapy, Occurrence of Progression Despite Therapy, and Average Change in Weight*

	Control	Carob-Flour Treated
Average duration of parenteral fluid therapy after treatment, in days (patients receiving parenteral fluids only)	8.1	9.3
Progression		
Percentage of all cases showing increased dehydration, weight loss, or diarrhea after 24 hours of therapy	33%	43%
Change in Weight		
Average change, in ounces, from first weighing after initial hydration to termination of therapy	−0.9	+2.1

need for parenteral fluids, and of the change in weight constitutes the major aspect of an analysis of the effect of therapy in diarrhea. Such an analysis is presented in Table 2. The average number of 24-hour periods subsequent to the initiation

of therapy during which parenteral fluid therapy was administered is compared for each group (only those cases in which parenteral fluid therapy was utilized being considered). The percentage incidence of progression is evaluated for each group. Progression was considered to have occurred if some evidence of an increased alteration in fluid balance appeared subsequent to 24 hours after the initiation of therapy as judged by a decrease in weight or the appearance of clinical dehydration, once corrected, or the necessity of a radical alteration in therapy, such as cessation of oral feedings or the intravenous administration of fluids not previously deemed necessary. The average net gain or loss in weight between the weight subsequent to the initial, apparently complete, restoration of extracellular fluid balance and the weight at the time of the discontinuance of therapy is also compared in Table 2.

The chart demonstrates the course of diarrhea in the treated and in the untreated group. The percentage of all cases in the particular group in which diarrhea was demonstrated on a certain day prior to or after the initiation of therapy is charted, and the resultant graph presents the approximate course of the disease state in the entire group.

The criteria utilized in this evaluation are considered to be as nearly objective as was possible. Measurements of actual fluid loss in stools were attempted but in every instance were discarded as impracticable on a large scale. The use of a single observer to make and record all observations is considered to have eliminated much of the variation in the evaluation. For the purpose intended, an exact determination of the degree of diarrhea or body fluid alteration present at a certain time is unnecessary. All that is necessary is that the same criteria are disinterestedly applied in each case, so that a truly proportionate representation of the course of the disease state is recorded for analysis—then the records of all cases will be truly comparable. It is believed that this necessity has been fulfilled.

COMMENT

Numerous—and, in many instances, recent—reports have appeared in the literature concerning the effects of a wide variety of vegetable products containing pectin and lignin on the course of infantile diarrhea. Apple powder,[1] banana products,[2] carrot soup,[3] blueberries,[4] pumpkin pulp,[5] and many other similar substances[6] have been considered to influence diarrhea favorably. The very multiplicity of these substances tends to belittle the value of each. If any one were of real value, it would seem probable after these many years of trial that one would be in general use to the exclusion of the others. The evidence presented in regard to their

1. O'Keefe, E. S.: Enteral Treatment of Diarrhea in Infancy, Including Epidemic Diarrhea of the Newborn, Am. J. Dis. Child. **76**:616 (Dec.) 1948.

2. Fries, J. H.; Chiara, N. J., and Waldron, R. J.: Dehydrated Banana in the Dietetic Management of Diarrheas of Infancy, J. Pediat. **37**:367 (Sept.) 1950.

3. Selander, P.: Carrot Soup in the Treatment of Infantile Diarrhea, J. Pediat. **36**:742 (June) 1950.

4. Krammer, H., and Wegricht, M.: A Contribution to Diarrhea Therapy, Wien. med. Wchnschr. **101**:206-207 (March) 1951.

5. Orlandelli, M.: Further Results of Treatment of Dyspepsia and Enteritis of Infants with Pumpkin Pulp, Clin. pediat. **33**:69-76 (Feb.) 1951.

6. Obes, J.: Colloids in Diarrhea; Agar and Karaya Gum, Arch. pediat. Uruguay **22**:512-526 (July) 1951.

effectiveness is indefinite: a statement of better weight gain,[1] or of a more rapid diminution in toxicity,[3] but little evidence for the conclusions drawn. One study of the effect of dehydrated banana in infantile diarrhea presents an alternate treated and control group, but the conclusion of the effectiveness of this preparation seems to be drawn purely from the demonstration of the earlier appearance of formed stools.[2]

Since the report of Smith and Fischer[7] carob flour has been widely used as a potent source of lignin for the treatment of infantile diarrhea. These investigators considered that carob flour demonstrated an antidiarrheic effect because the stools of their treated patients became rapidly formed and because there was an average 6½ oz. (180 gm.) weight gain between admission and discharge of treated patients. In other studies essentially similar responses have been shown, and it has been concluded that carob flour was effective or warranted further evaluation.[8] The only controlled study of carob flour therapy to date is reported by Plowright,[9] who studied the effects of this substance on 40 alternately treated and untreated patients with severe diarrhea. He, too, demonstrated a distinctly earlier appearance of the first formed stool after therapy was commenced in the treated group. Analysis of other aspects of the disease state which presumably demonstrate the effectiveness of the carob flour included the time of appearance of "cure" and the duration of hospitalization, but it is difficult to evaluate these factors, as no clarification of the criteria for "cure" or discharge from the hospital are given.

From the cited studies it can be seen that the chief effect of pectin- and lignin-containing vegetable products is upon the character of the stool, and in every instance these substances have produced an earlier appearance of formed stools in patients with diarrhea. Indeed, this seems to have been the intention of those workers who have used these substances in the therapy of diarrhea. It has been stated that the mechanical effect of the production of a bulky formed stool by this method is to rid the bowel of infected contents and thereby reduce toxicity.[3] Other writers have stated that the hydroscopic effect of these substances prevents fluid loss[2] or that the stool distended with water by lignin results in a greater formed mass, which, because it contains less water, dries faster.[7] All available evidence points to the fact that these substances, regardless of source, are hydroscopic and that the earlier appearance of formed stools in diarrhea subsequent to their administration is due to their ability to absorb water into their own voluminous mass. Examination of a mixture of carob flour and water demonstrates this effect as the flour gradually absorbs the water, increases in consistency, and after a short period resembles a formed stool. I have repeatedly stood by a bedside, heard the passage of a liquid stool, thereafter observed the formation of the stool as the hydroscopic carob flour

7. Smith, A. E., and Fischer, C. C.: The Use of Carob Flour in the Treatment of Diarrhea in Infants and Children, J. Pediat. **35**:422 (Oct.) 1949.

8. Beynon, D.: Arobon in the Treatment of Infantile Gastro-Enteritis: A Clinical Trial, Arch. Dis. Childhood **24**:41 (March) 1949. Andrews, H. S.: The Use of Carob Flour in Gastro-Intestinal Disturbances, J. Kentucky M. A. **49**:279-280 (July) 1951. Frandsen, A. D.: Treatment of Acute Diarrhea in Infants with Carob Flour, Nord. med. **44**:1171 (Oct.) 1950.

9. Plowright, T. R.: The Use of Carob Flour (Arobon) in a Controlled Series of Infant Diarrhea, J. Pediat. **39**:16 (July) 1951.

absorbed the water, and noted the result, an essentially formed stool with a large ring of stool water, already soaked into the diaper, surrounding it. Stools become more rapidly formed, but I have not observed any earlier reduction in stool water content.

The evidence presented in this study seems to corroborate the latter observation, as there is no evidence by any measurable means that stool fluid loss is reduced by carob flour in the treated group. Table 2 clearly demonstrates that there is no significant difference in the course of weight gain subsequent to its initial restoration by parenteral fluid therapy in the carob-flour-treated or untreated group. There is no significant difference in the duration of parenteral fluid therapy (chiefly by subcutaneous infusions after initial intravenous restoration), which was administered as apparently required by clinical dehydration, continued excessive stool fluid loss, or inadequate oral fluid intake. There was no significant difference in the incidence of progression of the disease state as determined by the appearance 24 hours after initial restoration of an increase in the signs of body fluid deficit: clinical dehydration, loss of weight, and/or a distinct increase in the fluid content of the daily stool (usually all three factors simultaneously). In retrospect, this does not seem in any way surprising, as there is certainly no reason to expect that the oral administration of a hydroscopic substance would reduce the loss of stool fluid. It is perhaps surprising that the administration of these substances does not increase the loss of stool fluid by absorbing additional water from the intestinal secretions.

Not only does carob flour exert no beneficial effect upon the loss of stool fluid, the chief danger in diarrhea, but when critically evaluated has no effect upon the course of the diarrhea itself (Chart). When a knowledge of the hydroscopic activity of lignin prompts a thorough examination of the diaper with its formed carob flour stool, the large amount of fluid represented by the voluminous mass and the large dark ring about the stool is recognized. Diarrhea was considered to be present until this voluminous stool and stained ring no longer appeared, and when judged in this light its duration was unaltered by carob flour. If carefully observed, infants treated with carob flour will be noted to pass liquid stools throughout the usual course of diarrhea, though their diapers, examined later, may contain formed masses.

So far as toxicity is represented by fever, the absorptive tendency of carob flour exerts no significant effect upon toxicity, as the average duration of fever was 7.0 days in the treated group and 6.8 days in the untreated group.

Our nurses have commented that the use of carob flour, by permitting the consolidation of stool water, prevents the mess of liquid stool which runs out of the diaper and onto the legs and bed. In addition, we have noted no instances of red irritated buttocks when carob flour was administered in diarrhea and believe that some locally protective effect is achieved. Inasmuch as the disagreeable problems of spreading stools and irritated buttocks may be major ones in the eye of the mother of an infant with diarrhea, the use of carob flour for the prevention of these difficulties may be indicated. There is no evidence that the pectin-lignin substances are deleterious in diarrhea. However, the present study seems to demonstrate clearly that they do not exert any beneficial effect upon the continued loss of stool water and the resultant alteration in body fluid balance.

SUMMARY

A controlled study of 47 cases of infantile diarrhea in which alternate patients were treated with carob flour is reported. The findings indicate that this substance does not significantly alter the course of diarrhea or the concomitant loss of stool fluid.

The enthusiastic cooperation of Captain Albert G. Miller in the execution of the study was greatly appreciated.

Captain Helmi Heikkila and the nursing personnel of the Pediatric Section, William Beaumont Army Hospital, assisted in the collection of data for this study; Captain Albert G. Miller assisted in the execution of the study.

LEAD POISONING

Observations in Fourteen Cases

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AND

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THE PURPOSE of this paper is to report 14 cases of chronic lead intoxication in order to stimulate interest in this disease so that cases may be found and treatment instituted early, before irreversible sequelae occur.

Lead poisoning in children is relatively common. The rarity of the diagnosis at any particular institution may mean merely that one is inclined to forget that such an entity exists. In recent years fairly large series of cases have been reported from various hospitals throughout the country. Ennis [1] reported 47 cases from Baltimore in 1950. Eighty-nine cases of lead poisoning were observed in infants' and children's hospitals in Boston during the years 1924 through 1933 (McKhann and Vogt).[2] Rapoport [3] reported 30 cases from the Children's Hospital, Philadelphia, in 1941.

Twelve of the 14 patients were admitted between June, 1951, and September, 1951, with 1 admitted in February, 1951, and 1 in December, 1951. Of 12 cases of lead encephalopathy, 10 occurred between the months June and September, 1951. Blackman [4] demonstrated the onset of lead encephalitis in 19 of 22 cases between the months of June and October. He suggested that fever and the heat of the summer and early fall months, which cause vasodilatation, may be important factors in precipitating the brain lesions. Rapoport and Rubin [3] observed the onset of manifestations of lead encephalopathy between the months of May and September in 24 of 30 children. They believe that the important factor in this connection is the fact that the antirachitic effect of solar radiation is greatest during this period, resulting in increased absorption of lead from the intestine.

The ingestion of paint on window sills and recently repainted walls was the commonest source of lead intoxication in our group. Although exterior house paint contains lead in amounts up to 70%, interior wall paint is usually free of

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1. Ennis, J. M., and Harrison, H. E.: Treatment of Lead Encephalopathy with BAL, Pediatrics **5**:853, 1950.

2. McKhann, C. F., and Vogt, E. C.: Lead Poisoning in Children, J. A. M. A. **101**:1131, 1933.

3. Rapoport, M., and Rubin, M. T.: Lead Poisoning, Am. J. Dis. Child. **61**:245, 1941.

4. Blackmann, S. S., Jr.: Lesions of Lead Encephalitis in Children, Bull. Johns Hopkins Hosp. **61**:1, 1937.

lead. However, the possibility that home owners themselves are repainting their walls with paints containing lead must be strongly considered.

In this series the commonest presenting symptoms were vomiting, abdominal pain, convulsions, and constipation. Since these manifestations are present in a wide variety of medical and surgical diseases, a diagnosis of lead poisoning will not be considered unless there is a high index of suspicion. Patient P. I. was

TABLE 1.—*Symptoms and Signs*

Patients	Pica	Abdominal Pain	Vomiting	Constipation	Duration of Symptoms	Osteosclerosis of Metaphysis of Long Bones	Physical Findings	Neurological Symptoms and Signs
A. S.	Present 1 mo.	Marked 2 wk.	Present 2 wk.	Absent	2 wk.	Present	Pallor; palpable liver; bilateral lid edema; tonsillitis	Ataxia; lethargy; generalized convulsion; coma
H. Q.	Present 2 wk.	Absent	Absent	Present 1 day	1 day	Present	Pallor; palpable liver	Ataxia; lethargy; coma; generalized convulsion
P. I.	Present 6 mo.	Absent	Absent	Absent	3 wk.	Present	Pallor; palpable liver	Irritability; left-sided convulsion; coma
O. V.	Present	Present 3 days	Present 3 days	Absent	3 wk.	Present	Pallor	Generalized convulsion; coma; ptosis of left lid
R. T.	Present	Present 3 wk.	Present 3 wk.	Absent	3 wk.	Present	Pallor; palpable liver; pharyngitis	Lethargy; generalized convulsion; coma; ptosis of left lid
A. T.	Present	Absent	Present 2 wk.	Absent	2 wk.	Present	Tonsillitis	Lethargy; irritability; coma
D. R.	Not elicited	Absent	Absent	Absent	2 days	Present	Palpable liver; bilateral otitis media; tonsillitis	Left-sided convulsion; stupor; left hemiparesis; left facial palsy
F. F.	Present few mo.	Absent	Marked 3 wk.	Marked 3 wk.	3 wk.	Present	Pallor	Irritability; dragged left foot
A. H.	Present 4 mo.	Absent	Absent	Absent	6 days	Present	Pallor; tonsillitis	Lethargy; ataxia; generalized convulsion
C. F.	Not elicited	Present 6 days	Present 6 days	Present 7 days	1 wk.	Present	Pallor	Lethargy; headache
D. S.	Present 4 mo.	Absent	Present 2 wk.	Absent	2 wk.	Present	Pallor; palpable liver; tonsillitis	Lethargy; irritability; tremors of upper extremities; strabismus of right eye
L. C.	Present	Absent	Present 1 wk.	Present 1 wk.	1 wk.	Present	Pallor	Dragged left foot
R. S.	Not elicited	Screaming at night 2 wk.	Present 1 day	Absent	2 wk.	Present	Palpable liver; bilateral otitis media; tonsillitis	Irritability
B. B.	Present	Absent	Present 1 day (ingested CCl_4)	Absent	1 day	Present	Palpable liver; bilateral otitis media; tonsillitis	Irritability

initially treated at another hospital for diabetic acidosis when it was found that her urine showed sugar (4+) and acetone (4+). Pallor was the commonest physical finding, being present as the only non-neurological sign in three cases. Inflammation of the upper respiratory tract or ears, present in 57% of these cases, offers an easy explanation of the symptomatology to the hasty and unsuspecting examiner. A palpable liver was present in seven cases, indicating its importance in the storage and excretion of lead.

As can be readily appreciated from Tables 1 and 2, there was definite evidence of encephalopathy in 10 of 14 patients. In D. R. and A. T., in whom tuberculous menin-

gitis coexisted with lead intoxication, it is impossible to say whether or not lead encephalopathy was present. The single most frequent encephalopathic manifestation was convulsion, usually generalized and prolonged. Other outstanding symptoms were lethargy, irritability, ataxia, ptosis of the eyelid, dragging of the foot, and tremors of the extremities. In 93% of the cases one or more of these symptoms preceded

TABLE 2.—*Spinal Fluid Findings*

Patients	Color	Pandy Reaction	Cells*	Total Protein, Mg./100 Cc.	Chlorides, Mg./100 Cc.	Sugar, Mg./100 Cc.	Culture
A. S.	Crystal clear	3+	2 L.	175	780	66	Negative
H. Q.	Crystal clear	Negative	0	260	640	125	Negative
P. I.	Crystal clear	1+	9 L.	89	845	143	Negative
O. V.	Crystal clear	4+	7 L.	200	694	76	Negative
R. T.	Crystal clear	4+	4 L.	195	712	80	Negative
A. T.	Crystal clear	4+	300 73% L. 27% P.	175	612	Trace	Negative
D. R.	Crystal clear	2+	83 L.	110	682	Trace	Mycobacterium tuberculosis
F. F.	Crystal clear	1+	13 M.	16	680	76	Negative
A. H.	Crystal clear	Negative	10 L.	12	713	85	Negative
C. F.	Crystal clear	3+	15 L.	185	715	64	Negative
D. S.	Crystal clear	2+	5 L.	140	671	86	Negative
L. C.	Crystal clear	3+	20 L.	110	...	80	Negative
R. S.	Crystal clear	Negative	0	80	750	64	Negative

* L. indicates lymphocytes; M., monocytes; P., polymorphonuclear leucocytes.

TABLE 3.—*Urinary Findings*

Patient	Urinary Lead		Sugar	Acetone	Albumin	Sulkowitch Reaction	Cells/High Power Field	Culture
	Mg./L.	Mg./24 Hr.						
A. S.	0.08	0.056	1+	0	2+	3+	30 WBC	Negative
H. Q.	0.157	0.094	1+	3+	0	1+	0	Negative
P. I.	0.375	0.122	3+	0	2+	3+	2 RBC	Negative
O. V.	0.50	0.202	2+	2+	0	4+	0	Negative
R. T.	0.10	0.034	Trace	2+	0	0	4 WBC	Negative
A. T.	0.210	0.048	0	0	0	1+	0	Negative
D. R.	0.10	0.084	Trace	Trace	0	3+	3 WBC	Negative
F. F.	0.60	0.074	1+	1+	1+	1+	4 WBC 4 RBC	Negative
A. H.	0.16	0.018	0	0	0	0	0	Negative
C. F.	0.36	0.184	0	2+	0	1+	0	Negative
D. S.	0.65	0.195	2+	2+	0	3+	2 WBC	Negative
L. C.	0.10	0.044	0	0	0	0	0	Negative
R. S.	0.13	0.081	0	0	0	0	0	Negative
B. B.	0.30	0.038	0	0	0	0	0	Negative

the convulsive episode, sometimes by as much as three weeks. Persistent and uncontrollable vomiting very commonly antedated the convulsion by several weeks.

In every case with suggestive symptoms and/or a history of pica (elicited in 11 cases) urinalysis, hemoglobin determination, differential blood smear, x-rays of chest and long bones, and spinal puncture were done immediately. These measures were completed in a matter of hours, and when a diagnosis of lead poisoning seemed justified treatment was instituted while a 24-hour urine specimen for lead was being collected.

The significant urinary findings, as indicated in Table 3, are the presence of sugar, acetone, and increased calcium. In a crystal-clear spinal fluid a positive Pandy reaction with a normal or almost normal cell count should arouse suspicion (Table 2).

In the majority of cases in this group there were upward of 1,500 basophilic stippled red blood cells per million red blood cells. The hemoglobin was almost always below 10 gm. per 100 cc. (Table 4). A typical zone of increased density at the metaphyses of long bones was demonstrated in every case.

In this series the urinary lead levels for 24 hours were 0.1 mg. per liter or more in every case except one. In this case (A. S.) there was a level of 0.08 mg. per liter, which is considered by some to be an upper normal limit.[5] A. S. had repeated convulsions, was in coma for three days, and survived to be discharged home blind. Apparently when the blood lead concentration rises to abnormal levels there is no consistent relationship between urinary levels and severity of symptoms. Toxicity of this metal is determined by the balance that exists among absorption, storage,

TABLE 4.—*Age, Race, Sex, and Hematologic Findings*

Patient	Age	Race	Sex	Blood Pressure, Mm. Hg	Sickle Cell Preparation	No. of Basophilic Stippled R. B. C. per Million R. B. C.	Hemoglobin, Gm./100 Cc.	W. B. C. per Cu. Mm.	Eosinophiles, %
A. S.	2 yr.	N	F	104/70	Negative	4,200	9.5	14,600	2
H. Q.	2 yr.	N	F	120/50	Negative	4,000	8.0	12,000	0
P. I.	28 mo.	W	F	114/88	.....	6,000	8.0	30,000	0
O. V.	2 yr.	N	M	120/60	Negative	3,000	5.5	9,500	3
R. T.	3 yr.	N	F	110/20	Negative	1,500	9.5	5,700	0
A. T.	3 yr.	N	M	100/30	Negative	0	6.5	16,000	0
D. R.	1½ yr.	W	F	100/70	.....	0	11.0	12,200	0
F. F.	1½ yr.	W	F	108/84	.....	7,400	6.0	11,000	0
A. H.	19 mo.	N	F	100/80	Negative	0	5.5	18,000	0
C. F.	3½ yr.	N	M	112/40	Negative	2,300	8.5	10,900	5
D. S.	22 mo.	N	F	110/60	Negative	17,000	9.5	11,200	0
L. C.	2½ yr.	N	M	110/60	Negative	4,500	9.0	8,400	10
R. S.	19 mo.	N	M	60/40	Negative	0	11.5	7,550	4
B. B.	14 mo.	N	F	62/44	Negative	0	11.5	9,200	2

and excretion. Expression of the disease depends on storage in the soft tissues. The patient may be described as being in lead equilibrium when excretion keeps pace with the intake and no storage of the element occurs.[6]

On admission a serologic test, Mantoux test, and blood chemistry studies were done in each case. Significantly, serum calcium was within normal limits, while serum phosphorus was reduced in three of eight cases. Alkaline phosphatase was not elevated. Blood urea was elevated in two cases but returned to normal on proper hydration. A transient elevation of blood sugar was found in three cases. A depression of blood sugar was found in one case (P. I.), owing to 100 units of regular insulin administered as treatment for diabetic acidosis.

In the differential diagnosis of lead intoxication (Table 5) many diseases were considered. The greatest difficulty was encountered when the question of tuberculous meningitis arose. When a child is first seen in coma with meningeal signs

5. Cantarow, A., and Trumper, M.: Lead Poisoning, Baltimore, Williams & Wilkins Company, 1944, p. 35.

6. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics, New York, The Macmillan Company, 1941, p. 720.

and increased protein and a pleocytosis in the spinal fluid and positive Mantoux reaction, the proper diagnosis is uniquely difficult.[7] In A. T. and D. R. the two entities coexisted. The spinal fluid cell count was of considerable value in arriving at the dual diagnosis early. In our series we found that patients with uncomplicated lead encephalopathy had normal or almost normal cell counts (Table 2). Other conditions such as sickle cell disease, diabetic acidosis, poliomyelitis, and gastroenteritis were less of a problem.

All patients were treated on a regimen which called for a high calcium and phosphorus intake (1 qt. [950 cc.] of milk a day) and large doses of vitamin D. When vomiting was not a factor, calcium gluconate, 10 grains (0.65 gm.) four times a day, was administered orally. Those who vomited were given a 10% solution of calcium gluconate by vein, the dose depending on the age. The more toxic patients were given sodium citrate orally, 0.5 to 1 gm. three times a day. In addition,

TABLE 5.—*Differential Diagnosis*

Patient	Admission Diagnosis	Rule Out
A. S.	Lead poisoning	Angioneurotic edema
H. Q.	Tuberculous meningitis	Poliomyelitis
P. I.	Lead poisoning	Diabetic acidosis
O. V.	Gastroenteritis	Sickle cell disease
R. T.	Upper respiratory infection with vomiting	Other causes of vomiting
A. T.	Tuberculous meningitis	Lead intoxication
D. R.	Tuberculous meningitis	Lead intoxication; poliomyelitis
F. F.	Lead poisoning	.....
A. H.	Febrile convulsion; acute bronchitis	Cerebellar tumor
C. F.	Vomiting of undetermined cause with anemia	.....
D. S.	Lead poisoning	.....
L. C.	Rheumatic fever	Lead poisoning
R. S.	Lead poisoning	Behavior problem
B. B.	Ingestion of carbon tetrachloride	Lead poisoning

sedatives and intramuscular injections of 25% magnesium sulfate solution, 0.2 cc. per kilogram of body weight every six hours for six doses, were administered to control encephalitic symptoms.

A blood transfusion was given if the hemoglobin was excessively low. Normal hydration was obtained and maintained in all cases by infusion and clyses.

Two patients with severe acute encephalopathy (O. V. and R. T.) were given dimercaprol (BAL) in addition to the above routine. Ennis [1] used dimercaprol in treating 16 patients with lead encephalitis. He concluded that it lowered the mortality and reduced the severity of the residua of severe lead encephalopathy. He employed dimercaprol in gradually increasing doses up to 4 mg. per kilogram of body weight every four hours for ten days. In our two cases the substance was used at a dose of 3 mg. per kilogram of body weight every four hours around the clock for ten days. At the conclusion of the treatment with dimercaprol, O. V. and R. T. had the same neurologic residual—ptosis of the left upper eyelid. It is of interest to compare the end-result in these two cases with those in three comparable

7. Ford, F.: Diseases of the Nervous System in Infancy and Childhood, Ed. 2, Springfield, Ill., Charles C Thomas, Publisher, 1944, p. 664.

cases of severe lead encephalopathy in which the patients were treated with the high calcium, phosphorus, and high vitamin D routine alone: One patient, A. S., was discharged home blind; another H. Q. died after being in coma for three days; the other, P. I., was discharged home with a spastic paralysis of the left extremities and a residual left facial palsy.

Patients D. R. and A. T. received a course of streptomycin by the intramuscular and intrathecal routes in addition to therapy for lead intoxication. D. R. was transferred to Seton Hospital after four months of treatment, while A. T. died while under therapy four days after admission.

Of the remaining seven patients, five of whom were considered to have mild encephalopathies, only D. S. had a detectable neurologic residual—tremors of both upper extremities.

Although lead intoxication is less common in children than many other diseases, it definitely exists today, and the possibility of poisoning by this metal should be kept in mind by physicians because of its high mortality and the severity of its residua.

SUMMARY

Fourteen cases of lead intoxication are presented, 12 of which occurred from June to September, 1951. In 10 of the 14 cases there was definite evidence of encephalopathy. In two cases tuberculosis meningitis coexisted, and the presence of lead encephalopathy could not be ascertained with certainty.

The signs and symptoms, diagnosis, treatment, and prognosis are briefly discussed.

VALUES FOR FECAL UROBILINOGEN IN CHILDHOOD

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IN THE management of many hematologic and hepatic disorders, it is useful to know the daily output of fecal urobilinogen. The values for output may serve as an index of the degree of activity of a hemolytic process, since there is a direct relationship between the rate at which degradation of hemoglobin occurs and the daily excretion of urobilinogen in the stool.

Destruction of hemoglobin occurs in the reticuloendothelial system, chiefly in the liver and spleen. Bilirubin is formed in the liver and excreted into the intestine. There it is reduced by bacterial action to urobilinogen, which in reality consists of mesobilirubinogen and stercobilinogen, according to Watson.[1a] The amount of urobilinogen depends on the reduction of bilirubin to urobilinogen.

Part of the fecal urobilinogen is reabsorbed into the portal circulation and returned to the liver to be reexcreted in the bile. A smaller part is absorbed into the general circulation and is excreted by the kidney, after which it is oxidized to urobilin. The bulk of the urobilinogen is excreted in the feces, the amount normally ranging from 40 to 280 mg. a day for adults.[1]

The recent use of the isotope N^{15} as an investigative tool has made it possible to verify the derivation of bile pigments from hemoglobin.[2] A surprising discovery, however, was made, that at least 11% of the bile pigments come from sources other than hemoglobin of the erythrocytes. It has been suggested that these other sources are hemoglobin which has escaped incorporation into erythrocytes in the bone marrow, myoglobin, and the cytochromes or catalase or porphyrins or heme not used in the synthesis of hemoglobin; also, perhaps there is direct synthesis of bile pigments without involvement of porphyrins. Thus, the long-established theory that bile pigments are derived solely from breakdown of circulating hemoglobin must be modified. It is now clear that the figures for daily excretion of fecal urobilinogen represent a large part, but are not a measure, of the total daily degradation of hemoglobin.

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1. (*a*) Watson, C. J.: Medical Progress: Bile Pigments, New England J. Med. **227**:665 (Oct. 29); 705 (Nov. 5) 1942. (*b*) Singer, K., and Miller, E. B.: Studies in Urobilinogen, Bull. New England M. Center **2**:302-305 (Oct.) 1940.

2. London, I. M.; West, R.; Shemin, D., and Rittenberg, D.: On the Origin of Bile Pigment in Normal Man, J. Biol. Chem. **184**:351-358 (May) 1950. London, I. M.: The Conversion of Hematin to Bile Pigment, J. Biol. Chem. **184**:373-376 (May) 1950.

Tat, Greenwalt, and Dameshek,[3a] in 1943, reported their findings in 30 normal newborn infants, who excreted only traces of urobilinogen in the stools during the first two weeks of life, as bacterial activity in the intestine was insufficient to reduce bilirubin to urobilinogen at that early age. Studies of a second group of children whose ages ranged from 2 months to 11 years gave values for fecal urobilinogen that were less than 2.5 mg. per day for children less than 2 years of age and that ranged from 2 to 7 mg. per day for children 3 to 11 years of age. In their final group, consisting of 4 children with hemolytic disorders, 44.6 to 186 mg. of urobilinogen per day was excreted.

Confusion has resulted from the use, by different authors, of different standards by which the values for fecal urobilinogen have been judged. Since Watson's method of colorimetric estimation of fecal urobilinogen, described in 1936,[4] has now found general acceptance, it is likely that the standards used by various authors in the future will be more uniform than they have been.

Since the figures given by different authors for fecal urobilinogen excreted daily by children vary widely,[3] we decided to study a series of normal controls as well as a series of patients with evidences of a hemolytic or hepatic disorder, in order to establish values for urobilinogen excreted in these different groups at different ages.

Fecal Urobilinogen in Children

	Controls (73 Cases)				Hemolytic Diseases (20 Cases)			
Age, Years	Cases, No.	Mean, Mg./24 Hr.	S. D.*	Range	Cases, No.	Mean, Mg./24 Hr.	S. D.*	Range
<1	19	3.8	4.2	0.03-14	5	15.1	18	0.07-37
1-4	22	10.9	9.1	0.9-39	6	218.5	121	77-369
5-9	12	24.4	12.2	2.7-39	6	331.7	291	91-1,397
10-14	20	45.2	22.9	7.3-99	3	205.0	115	73-275

* S. D. is the standard deviation of the distribution of cases; about 95% of cases can be expected to fall within the limits of ±2 S. D. of the mean. In calculating the mean, when there were several observations for an individual, their average was used.

THE PRESENT STUDY

Ninety-three infants and children from a general pediatric hospital service were studied during the period 1943 through 1951 (Table). They ranged in age from 5 days through 14 years. Twenty of the children had known hemolytic disorders, including 12 with congenital or acquired hemolytic jaundice, 4 with erythroblastosis fetalis, 2 with acute hemolytic anemia, and 1 each with thalassemia and thrombocytopenic purpura. The disease of the remaining 73 patients, used as controls, could be classified in four categories: (1) congenital anomaly, (2) neoplasm, (3) chronic infection, and (4) traumatic condition. For most patients, stools were collected for a 96-hour period, and the average daily excretion of urobilinogen was determined by Watson's method.[4] The method was standardized with urobilin by the procedure of Schwartz, Sborov, and Watson.[5]

3. (*a*) Tat, R. J.; Greenwalt, T. J., and Dameshek, W.: Output of Bile Pigment by Newborn Infants and by Older Infants and Children, Am. J. Dis. Child. **65**:558-570 (April) 1943. (*b*) Josephs, H. W.: Urobilin Excretion of Infancy and Childhood: Relation to Blood Destruction and Formation, Bull. Johns Hopkins Hosp. **55**:154-168 (Aug.) 1934.

4. Watson, C. J.: Studies of Urobilinogen: I. An Improved Method for the Quantitative Estimation of Urobilinogen in Urine and Feces, Am. J. Clin. Path. **6**:458-475 (Sept.) 1936.

5. Schwartz, S.; Sborov, V., and Watson, C. J.: Studies of Urobilinogen: IV. The Quantitative Determination of Urobilinogen by Means of the Evelyn Photoelectric Colorimeter, Am. J. Clin. Path. **14**:598-604 (Dec.) 1944.

In the control series, the average amount of urobilinogen excreted in the feces of the 19 children who were less than 1 year of age was 3.8 mg. per day; in no case did it exceed 14 mg. (Table). The average value increased with increasing age so that it was 10.9 mg. for the age group 1 to 4 years, with one-third of the children excreting more than 15 mg. (The highest value, 39 mg. per day, was for a child convalescing from multiple burns.) For the age group 5 to 9 years the average value was 24.4 mg., and for those in the age group 10 to 14 years it was 45.2 mg. per day. There was considerable overlap of the ranges of values among the age groups (Table and Charts 1 and 2).

Five children who had values in excess of normal for daily excretion of fecal urobilinogen for their age groups were not included in the control series. Three of these children, aged 3, 5, and 8 years, who had acute leukemia, excreted 97, 45, and 80.6 mg. of fecal urobilinogen per day, respectively. A fourth child, aged 10

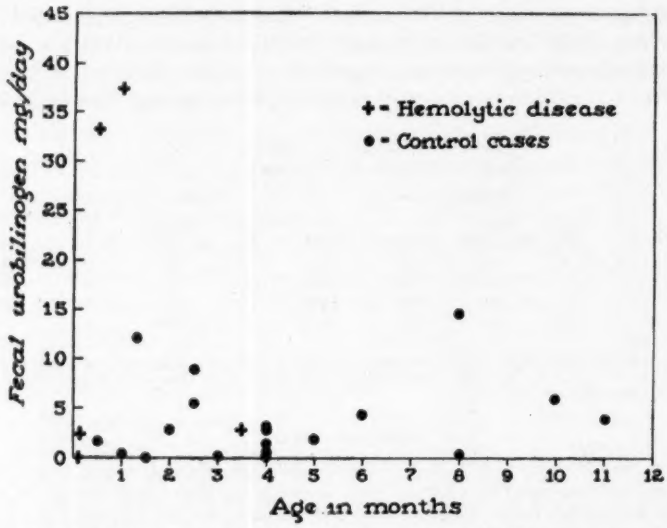

Chart 1.—Daily excretion of fecal urobilinogen in patients less than 1 year of age.

years, with active rheumatoid arthritis, excreted 128 mg. per day. The fifth child was a 5-year-old girl with pancytopenia and suppression of bone-marrow activity in all elements. For no apparent reason, after three blood transfusions she gave evidence of increased blood destruction by a daily output of 96 mg. of fecal urobilinogen. An increase in hemolysis has been reported in the presence of acute leukemia as well as in acute infections.[6] This might explain the abnormally high values obtained in most of these five patients who were not considered as fulfilling the requirements of the control series and were not included in the tabulation.

In the group of 20 children with hemolytic disorders, there were 3 whose fecal excretion of urobilinogen was within normal range for their age group. Two infants

6. Hagen, P. S., and Watson, C. J.: Hypersplenism and Hemolytic Anemia in Leukemia: Results of Splenectomy, in Proceedings of the Third International Congress of the International Society of Hematology, 1951, New York, Grune & Stratton, Inc., 1951, pp. 95-98.

aged 5 days and 1 week, respectively, who had erythroblastosis, excreted 2.5 mg. and 0.07 mg. of urobilinogen, respectively, per 24 hours, in the stools. This may have been due to the fact, noted previously, that minimal bacterial activity in the bowel of the newborn infant results in incomplete reduction of bilirubin to urobilinogen. However, two older infants with erythroblastosis had increased daily fecal urobilinogen excretion of 33 and 37.4 mg., respectively. A third exception was a child aged 10 years; she had hereditary leptocytosis in a quiescent phase, and the value for fecal urobilinogen was 72 mg. in 24 hours. In all other instances, the amount of urobilinogen excreted daily was sufficiently increased over normal to be compatible with the presence of an active hemolytic process. In most instances, the amount of urobilinogen excreted in this group was more than 100 mg. per day; the largest amount was 1,397 mg., and that was by a child with acute hemolytic anemia.

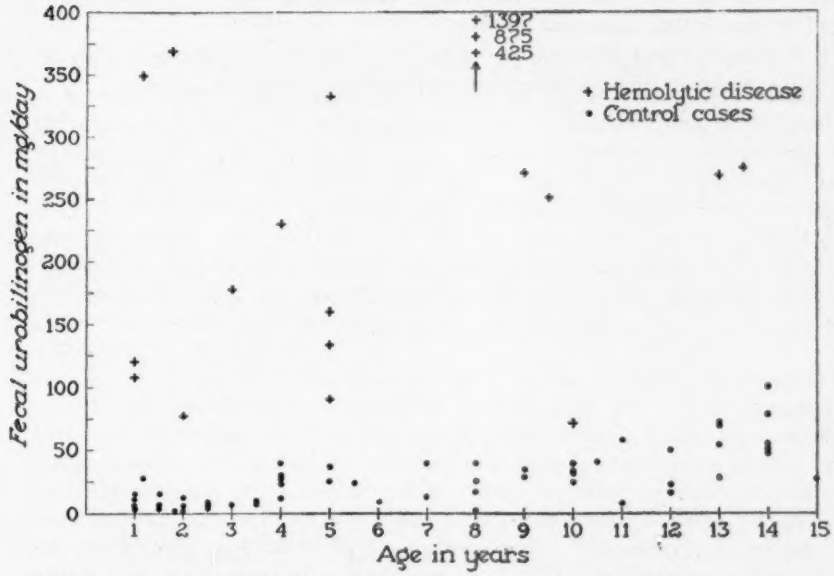

Chart 2.—Daily excretion of fecal urobilinogen in the age group 1 to 14 years inclusive.

The lowest values were obtained in four infants, 3 to 4 months of age, with congenital biliary atresia. Their stools contained less than 1 mg. of urobilinogen per day. This is evidence of failure of bile pigments to reach the intestine and to be reduced to urobilinogen. It is significant that recent trends in the use of antibiotic therapy may result in extremely low figures for daily fecal output of urobilinogen, owing to relative sterilization of the intestinal tract which removes bacteria necessary to reduce bilirubin to urobilinogen.[7] When what appears to be a normal fecal output of urobilinogen is encountered in a patient with other evidences of a hemolytic or hepatic disorder, one should determine whether such an output is related to treat-

7. Sborov, V. M.; Jay, A. R., and Watson, C. J.: The Effect of Aureomycin on Urobilinogen Formation and the Fecal Flora, Proc. Central Soc. Clin. Research **22**:70-71, 1949: J. Lab. & Clin. Med. **37**:52-59 (Jan.) 1951.

ment with antibiotics. This output may be significant when related to the total value for circulating hemoglobin. Values obtained by us for normal children and for those with hemolytic disease are much higher than those mentioned by other authors.[3]

SUMMARY AND CONCLUSIONS

The values for fecal urobilinogen were determined in a series of 73 children who did not have hemolytic disease and who were used as controls, and in a series of 20 children who had hemolytic disease. The daily mean values, distributed according to age groups, for the controls and for those with hemolytic disease, respectively, were as follows: under 1 year of age, 3.8 and 15.1 mg.; ages 1 through 4 years, 10.9 and 218.5 mg.; ages 5 through 9 years, 24.4 and 331.7 mg.; and ages 10 through 14 years, 45.2 and 205.0 mg.

The foregoing data indicate that the mean values for fecal urobilinogen tend to increase with age, and that they are greater, at any given age, in children with hemolytic disease than in normal children.

It is concluded that determination of the value for fecal urobilinogen offers a practicable means of demonstrating abnormal hemolytic activity in children.

RENAL AMINO-ACIDURIA

Report of Two Cases, with Studies of Amino Acid Excretion Patterns

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AMONG the so-called inborn errors of metabolism as defined by Garrod [1] is a renal tubular defect originally described by Fanconi [2] in 1946 as nephrotic glycosuric dwarfism with hypophosphatemic rickets. Fanconi [3] later found this to be identical with what he termed "cystine disease," or, because of the presence of increased amounts of amino acids other than cystine, "amino acid diabetes." The syndrome is characterized by impaired renal tubular reabsorption of glucose, inorganic phosphate, and bicarbonate, as well as amino acids. Accompanying these defects in the kidney, and probably as a result of them, are acidosis and a negative calcium balance with the development of renal rickets. The increased losses of glucose may produce sufficient depletion of hepatic glycogen to produce a ketosis which enhances the acidosis.

The amino-aciduria of this syndrome is the prominent feature which differentiates it from similar renal tubular defects, such as renal rickets or renal diabetes. However, the amino-aciduria relates the syndrome to two similar renal tubular defects in amino acid metabolism, cystinuria and cystinosis. Cystinuria is often first suspected with the appearance of cystine crystals in urine sediments, which are easily detected because of the insolubility of this amino acid; however, in much of the literature the generalized amino-aciduria of the Fanconi type is considered merely as a severer form of cystinuria which develops in the latter course of the disease state.

In recent years, several studies of amino acid metabolism in cystinuria have been reported. Dent and Rose studied the amino acid content of the urine of persons with cystinuria by the use of paper chromatography. In addition to excessive quantities of cystine (more than 1 gm. in 24 hours), they found abnormally large

From the Department of Biology, University of San Francisco, and the Departments of Pediatrics and Radiology, University of California School of Medicine.

1. Garrod, A. E.: Inborn Errors of Metabolism, London, Henry Frowde, 1909.

2. Fanconi, G.: Der frühinfantile nephrotisch-glykosurische Zwergwuchs mit hypophosphatämischer Rachitis, Jahrb. f. Kinderheilk **147**:299-338, 1946.

3. Fanconi, G.: Weitere Beiträge zur Cystinkrankheit (der Amindiabetes), Helvet. paediat. acta **1**:183-205, 1946.

4. Dent, C. E., and Rose, G. A.: Amino Acid Metabolism in Cystinuria, Quart. J. Med. **20**:205-219, 1951.

amounts of lysine and usually of arginine as well. All other naturally occurring amino acids were normal in these urines. Yeh and associates,[5] using microbiological methods, analyzed the urine of a 5-year-old cystinuric girl. Cystine, lysine, and arginine were also elevated in this case, other amino acids remaining normal or decreased (aminoacetic acid and histidine). These authors suggested that cystine storage (cystinosis) and a generalized amino-aciduria might later develop in this patient, when renal function was impaired to a greater extent. Stein [6] studied the excretion of amino acids in the urine of five cystinuric patients by the use of the more quantitative chromatographic technic, which utilizes the ion-exchange resin "Dowex-50." In each case the content of arginine, lysine, ornithine (not detectable by microbiological methods), and cystine in the urine was from 50 to 100 times higher than normal. Isoleucine excretion was about twice normal, but excretion of taurine (a cystine derivative) was less than one-third of normal. All other ninhydrin-positive substances (amino acids) were normal in concentration. Prakken,[7] reporting on a case of congenital cystinuria with cystine calculi in a 3-year-old boy, also found by chromatographic analysis an increased excretion of cystine and lysine in the urine.

In cystinosis there are not only increased excretion of cystine, probably together with a generalized amino-aciduria, but also serious systemic disease and deposition of cystine crystals in the tissues, particularly of the reticuloendothelial system. Cystinosis is therefore a disease which is usually fatal at an early age, whereas cystinuria is compatible with a normal existence, except for the likelihood of the formation of cystine calculi.

The amino-acidurias, particularly cystinuria, which has been most extensively studied, have been considered by some investigators as due entirely to a renal defect, while others feel that an abnormality in the intermediary metabolism of amino acids, presumably a hepatic defect, plays a role in the pathogenesis of the disease state. In the latter category are Brand, Cahill, and Harris,[8] who state that the cystine excretion in cystinuria is actually due to inability to metabolize cysteine although, according to these investigators, methionine—because of its convertibility to cysteine—serves as the main dietary source of the extra cystine in the urine of cystinuric persons. The oral administration of cystine to a cystinuric patient did not increase the urinary output of this amino acid in the experiments of Brand and associates,[8] whereas orally administered cysteine or methionine did so. Dent and Rose,[4] on the other hand, attribute the amino-aciduria only to a renal defect. They suggest that the results of Brand and associates are due to the poor solubility of cystine, which impairs its absorption from the gastrointestinal tract. Thus, only low blood levels of cystine occur when it is orally administered. For this reason, excretion is not increased, in contrast to that observed following the administration of the more soluble and better absorbed cysteine or methionine. However, as already

5. Yeh, H. L.; Frankl, W.; Dunn, M. S.; Parker, P.; Hughes, B., and Gyorgy, P.: The Urinary Excretion of Amino Acids by a Cystinuric Subject, Am. J. M. Sc. **214**:507-512, 1947.

6. Stein, W. H.: Excretion of Amino Acids in Cystinuria, Proc. Soc. Exper. Biol. & Med. **78**:705-708, 1951.

7. Prakken, H.: A Case of Congenital Cystinuria, J. Pediat. **40**:186-191, 1952.

8. Brand, E.; Cahill, G. F., and Harris, M. M.: Cystinuria: II. The Metabolism of Cystine, Cysteine, Methionine, and Glutathione, J. Biol. Chem. **109**:69-83, 1935.

noted, while in Brand's experiments with oral administration cystine did not appear as extra cystine in the urine, it did evoke increased excretion of inorganic sulfate, which suggests that it was absorbed and catabolized.

We have recently studied two cases of amino-aciduria in children, which were characterized by an elevated excretion of all naturally occurring amino acids in the urine. Three similar cases of the condition in adults were reported by Dent.[9] The urinary amino acid pattern in our cases indicated that the patients were not cystinuric as described by the other workers but illustrated, rather, the full-blown generalized amino-aciduria of the Fanconi syndrome. This, we believe, should be differentiated from cystinuria on the basis of these chemical findings.

One of our patients is alive at the age of 2½ years, and her symptoms are relatively mild. The other child died at the age of 16 months and at autopsy presented the picture of cystinosis similar to that described originally by Fanconi and, recently, by Hottinger [10] and by King and Lochridge [11] with typical kidney lesions and cystine crystals in the reticuloendothelial system. It is likely that in this case a diagnosis of generalized amino-aciduria would not have been made if biochemical studies to evaluate the extent of the urinary amino acid excretion had not been done prior to death, since at autopsy the observed conditions appeared characteristic only of cystinosis. It is possible that many, if not all, cases of cystinosis diagnosed only at autopsy are actually terminal manifestations of the generalized amino-aciduria of the Fanconi syndrome. That the two diseases are actually identical was suggested in 1937 by Beumer and Wepler.[12]

REPORT OF CASES

CASE 1.—S. C. was born at term after an uncomplicated pregnancy, weighing 7 lb. 8 oz. (3,400 gm.) and on initial examination was considered normal. She was fed at breast and given orange juice and vitamins. Feedings were taken eagerly, and she was said to have gained weight initially at a normal rate, weighing 13 lb. (5,896 gm.) at 3½ months. Development was considered normal—she smiled at the age of 1 month; she vocalized at 3 months, and two teeth erupted at 4 months.

She was well until the age of 4 months, at which time a "cold" characterized by coryza, tearing, cough, and low-grade fever developed. She refused all feedings and was then changed from breast milk to Baker's milk and penicillin orally was prescribed. From this time on, anorexia and weight loss were prominent findings. The child was said by the mother to be feverish, and listlessness was marked.

At the age of 5 months she was hospitalized in a neighboring community, where the following positive physical findings were reported: Her temperature was 38.3 C. (100.4 F.), There were marked dehydration, heart sounds of poor quality, with a rate of 120 per minute, poor muscular development, and craniotabes. The impression at this time was profound dehydration and probable acidosis from an undetermined cause. Laboratory study revealed a white blood cell count of 12,350 with the following differential count: polymorphonuclears, 71%; nonfilamented cells, 2%; lymphocytes, 25%, and monocytes, 2%. The red blood cell count was 3,730,000 with 10.9 gm. of hemoglobin per 100 cc. Kolmer and Kahn reactions were negative. The spinal fluid

9. Dent, C. E.: The Amino-Aciduria in Fanconi Syndrome: A Study Making Extensive Use of Techniques Based on Paper Partition Chromatography, Biochem. J. **41**:240-253, 1947.

10. Hottinger, A.: Über Cystin-Diathese, Ann. pædiat. **156**:257-283, 1941.

11. King, F. P., and Lochridge, E. P.: Cystinosis (Cystine-Storage Disease): Report of a Case with Chemical Isolation and Quantitative Determination of Cystine in Lymph Nodes, Spleen, and Liver, A. M. A. Am. J. Dis. Child. **82**:446-455, 1951.

12. Beumer, H., and Wepler, W.: Über die Cystinkrankheit der ersten Lebenszeit, Klin. Wchnschr. **16**:8-10, 1937.

contained 170,000 fresh red blood cells and 150 white blood cells, and 100% polymorphonuclears, and the culture was negative. Repeated urinalyses revealed 2 to 3+ reactions for sugar and albumin. A trace of acetone was found on one occasion. Roentgenograms of the skull showed nothing abnormal. Roentgenograms of the long bones revealed a thickened periosteum.

Her hospital course was stormy. Upon entry she was given a clysis of 250 ml. of ⅙ M sodium lactate with 0.5 ml. of hyaluronidase (alidase®). Three hours later her temperature was 41.9 C. (105.8 F.) rectally, respiratory rate 120 and pulse rate 260 per minute, and carpopedal spasm was present. She was treated with 5 ml. of 10% calcium gluconate intramuscularly and alcohol rubs. She responded to this but ran a febrile course, ranging between 37.7 C. (98.6 F.) and 38.8 C. (100.4 F.), throughout her hospital stay. She accepted small amounts of milk from a cup, though none from a bottle, and took very little solid food.

The child was first seen at the University of California Hospital at the age of 5 months 1 week, having been transferred directly from another hospital for diagnosis. The family history, obtained on admission to University of California Hospital, revealed that her parents were of Nicaraguan extraction and in good health. She had a normal 4-year-old brother and a grandfather with diabetes mellitus.

Physical examination on entry revealed a pale, listless child so weak she could not hold her head up. Measurements were as follows: weight 12 lb. 8 oz. (5,669 gm.) (10th percentile for 6 months); height 60.8 cm. (50th percentile for 6 months); head 38.8 cm. (10th percentile for 6 months); and chest 35.8 cm. (90th percentile for 6 months). The skin had a gray cast and poor turgor. The mucous membranes were pale. Craniotabes was present. The maxillary central incisors had erupted. The thorax was poorly clothed, and there was some beading at the chondrocostal junctions. The lungs were clear. The heart was enlarged to the anterior axillary line (rate 100). No murmurs were heard, but the sounds were of poor quality. The peripheral pulses were intact and equal. The abdomen was convex, soft, and atonic. Small hard masses were palpable and thought to be inspissated fecal material. The liver was palpable 2.5 cm. below the right costal margin. There was a sense of resistance in the left upper abdominal quadrant which could not be clearly defined but was later identified as an enlarged spleen. The fingers and toes were extremely long. There was an irregularity of the middle third of the right clavicle. Muscular power was markedly diminished. The impression was that the child had a generalized metabolic disorder of undetermined type. Laboratory results were as follows: The hemoglobin was 10 gm. per 100 cc., which after two transfusions rose to 13 gm.; the red blood cell count rose from 3,600,000 to 4,700,00, and the white blood cell count was 9,400. The differential count was as follows: polymorphonuclears 45%—nonfilamented 7%—lymphocytes 50%—and monocytes 4%. The urine was yellow and cloudy and of insufficient amount to measure specific gravity. The pH varied from 5.0 to 6.0. There was a consistently positive reduction of Benedict's solution from olive to brown. The reaction for acetone on entry was 4+ and remained so for three days but then became negative. Albumin was constantly present, varying from 1+ to 4+. There were two to three white blood cells, a high dry field, and an occasional hyaline and granular cast. The result of a urine examination for cystine crystals was negative. The urine was found to contain very large amounts of all amino acids, as reported later. Blood chemistry studies revealed: carbon dioxide 26 vol. %; bicarbonate 11.3 mEq. per liter; chloride 117 mEq./l.; sugar 116 mg./100 ml.; calcium 10.6 milligrams per hundred milliliters; phosphorus 7.6 milligrams per hundred milliliters; phosphatase three units, and nonprotein nitrogen was 37 milligrams per hundred milliliters. Two glucose tolerance tests were done:

	Mg. per 100 Ml.	Mg. per 100 Ml.
Fasting	126	136
1 hour	198	182
2 hours	148	140
3 hours	120	106

The blood did not contain galactosazone. The plasma amino nitrogen content was normal. The results of tuberculin and hyaluronidase skin tests were negative. Roentgen findings are discussed in another section of this paper. The electrocardiogram was considered probably within normal limits except for a rapid rate. Minimal right ventricular hypertrophy was thought to be a possibility.

The child was essentially afebrile throughout her stay, with the exception of a few spikes to 38 C. (100.4 F.). She was treated with fluids parenterally, transfusions, regular evaporated milk formula, and baby soft diet. Weight loss was slow but constant. The weight on discharge was 10 lb. 5 oz. (4,555 gm.). She took feedings very poorly and refused anything from a bottle. On her discharge an evaporated milk formula, baby foods, protein supplement, and vitamins were prescribed. She was seen several times in the clinic before her second hospital admission, at the age of 7 months. On these visits the physical findings were unchanged, and the weight remained essentially the same. The only item of food which she would accept eagerly was orange juice.

Her second admission occurred after a fever with a temperature of 38.8 C. (101.8 F.) developed and she refused all fluids. Physical findings at this time were unchanged, with the exception of marked dehydration, which was present. Laboratory studies provided the following data: The spinal fluid contained 80 fresh red blood cells per cubic millimeter and gave a negative Pandy reaction. The blood hemoglobin level was 14 gm. per 100 cc.; the red cell count 4,800,000, and the white cell count 8,300, with polymorphonuclears 67% (nonfilamented 1%), lymphocytes 28%, eosinophiles 1%, and monocytes 4%. The pH of the urine was 6.0; it contained albumin (2+), sugar (1+), and acetone (2+), and was loaded with hyaline and granular casts. The urine was sterile on culture.

The child was treated with penicillin intramuscularly and fluids parenterally, and her temperature, which reached 39 C. (102.2 F.), dropped within 48 hours to normal and remained so until discharge.

The child was seen on several occasions in the pediatric clinic prior to her final hospital admission, at the age of 17 months. She became much less listless, and she took orange juice eagerly and milk with less urging. At the age of 9 months she was attempting to crawl and at 10 months was walking holding on. At 1 year she weighed 12 lb. 7 oz. (5,220 gm.) and had six teeth. On all examinations, however, she was extremely pale and appeared chronically ill. The liver was palpable 2 to 3 cm. on all examinations. She was last seen in the clinic at the age of 17 months, seven days following the onset of rubeola. During that time she had taken almost no food or fluids and had urinated infrequently. On physical examination the child appeared moribund, with profound dehydration, an icteric tinge to the skin and scleras, a faint macular rash over the skin surface, and a slow respiratory rate. Heart sounds were of poor quality, with marked bradycardia. The liver was palpable 4 cm. below the right costal margin and the spleen 3 cm. below the left costal margin.

She was transferred to the communicable disease ward of the San Francisco County Hospital, where she died several days later.

A postmortem examination disclosed deposits of cystine crystals throughout the reticulo-endothelial system. There was evidence of hyperparathyroidism, and the proximal renal tubules showed regenerating epithelium. The details of the microscopic findings are described and discussed in another paper, to be published elsewhere.[13]

Case 2.—J. A., a 2-year-old white girl, entered the University of California Hospital on June 12, 1951, with the chief complaints of having always been small, having had frequent episodes of vomiting, and a finding of glycosuria one week before admission.

The child was delivered by Caesarean section three weeks before term and weighed 4 lb. 12 oz. (2,155 gm.) at birth. She did well for the first month of life but since that time had always eaten poorly, vomited a great deal, and failed to gain weight properly. At the age of 2 years she was eating mostly strained foods. The child sat at 6 months of age, stood at 8 months, walked at 14 months, and has always seemed alert mentally.

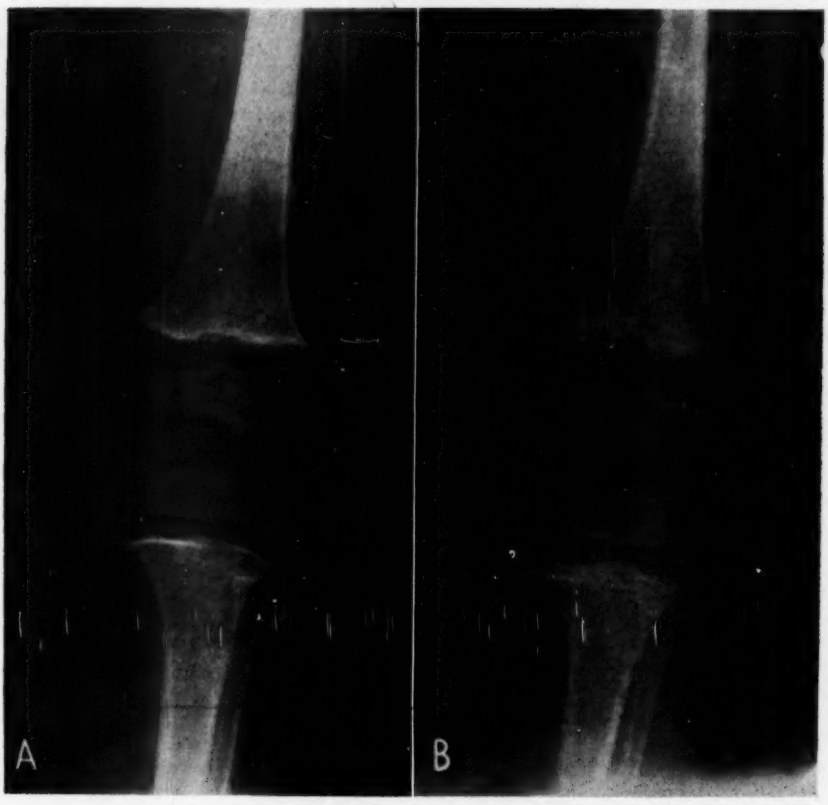
A week prior to entry on a routine test her urine was found to contain sugar, and, after this observation had been repeated a few times, she was referred to the University of California Hospital for further study.

A review of the family and past history revealed that the parents and one sibling were well. The mother had previously given birth to a deformed child, who died at birth. The only illness the baby had had was chicken pox.

13. King, W. Bradley: An Anatomical Study of a Case of Cystinosis, Stanford M. Bull. to be published.

Physical examination revealed a very small, poorly nourished baby appearing chronically ill. She weighed 18 lb. 8 oz. (8,395 gm.) and was 80 cm. tall. The head circumference was 47.5 cm. (25th percentile for age). The positive findings included shotty bilateral cervical adenopathy and mildly enlarged tonsils. The liver was down 1 cm. below the right costal margin; the spleen was not felt.

On admission the urine was yellow and clear, with specific gravity 1.014, pH 6.0, 2 + albumin, and green reduction for sugar. The reaction for acetone was 3 +. There were two to three white blood cells, a few red blood cells, and a few granular casts per high power



Roentgenograms of J. A. (Case 2). *A*, Early film, showing spur; *B*, late film, showing rachitic changes.

dry field. The urinalysis was repeated six or seven times, and the findings remained approximately the same. The blood count revealed 13 gm. of hemoglobin per 100 cc., 4,000,000 red blood cells, and 7,600 white blood cells, with a fairly normal differential count.

Chemistry studies showed nonprotein nitrogen 28 mg. per 100 cc., albumin 4.5 gm., globulin 2.4 gm., serum calcium 11.0 mg., serum phosphorus 2.4 mg., and basic phosphatase 20 units. A glucose tolerance curve revealed a fasting blood sugar level of 43 mg. per 100 cc., half-hour level of 129 mg., one hour level of 109 mg., and two hour level of 133 mg.; urinary chlorides were 80 mEq. per liter. A phenolsulfonphthalein test was done, and 40% of the total amount of dye was excreted in two hours.

The urine was examined and found to contain large amounts of all the amino acids (as reported later).

The roentgen findings are detailed and discussed in a subsequent portion of this paper.

The diagnosis of amino-aciduria was made and the child was discharged. Since then, she has been followed in the clinic. Her failure to grow has continued. She has remained in acidosis constantly, and the rickets has shown considerable progression, both clinically and roentgenologically. The latest blood chemistry study revealed that her amino nitrogen level was not elevated. Her carbon dioxide-combining power was 36 vol. % (15.6 mEq. per liter). The reducing substance in the urine has been identified as glucose.

Roentgen Findings

Case 1 (S. C.).—A skeletal survey showed a generalized demineralization of the skeleton, and the trabeculae appeared somewhat coarsened. Subperiosteal new bone had been formed along the shafts of the long bones of the upper and lower extremities. Some periosteal resorption of the lateral cortex of the proximal parts of both radii was present. The margin of the bone had a frayed appearance instead of the normal, dense, compact bone usually present. There were bony spurs arising from the margin of the metaphyses of the long bones, particularly the distal ends of the femora.

The zone of provisional calcification was diminished in density but was clearly defined. The epiphyseal cartilage was of normal width.

Eight months after the previous examination, roentgenograms of the wrists and ankles showed a decrease in the density of the bones. The zone of provisional calcification had become somewhat irregular. The metaphyseal spurs had not changed in appearance.

A chest film showed no evidence of disease; gastrointestinal serial studies showed normal conditions, and the kidneys, ureters, and bladder appeared normal, both by subcutaneous and by intravenous urograms.

Case 2 (J. A.).—There was no retardation of bone age. There was an unusual appearance of the metaphyses of all of the long bones, due to spurs arising from the cortical margins of the bones, most prominent in the wrists and knees. There were vertical lines of radiolucence resembling fractures extending through the spurs along the medial surface of the distal ends of the femora. The zones of provisional calcification were of normal density, and the epiphyseal plates were of normal width.

Eight months after the previous examination a skeletal survey showed that there had been a marked change in the appearance of the ends of the long bones. The zone of provisional calcification had disappeared, and the metaphyses had acquired an irregular frayed appearance. The epiphyseal plates were thickened; there was some flaring of the ends of the long bones, and the distal ends of the ulna were bowed towards the radii. The metaphyseal plates were still present, and the distal ends of the ribs were expanded. There appeared to be a generalized demineralization of the skeleton. The changes present in the skeleton were typical of those found in rickets.

Examination of the kidney with intravenous urograms showed some excretion of the opaque medium by both kidneys, but in poor concentration. Retrograde pyelograms were made and were entirely normal.

Special Chemical Studies

At various intervals, as noted in Tables 1, 2, and 3, special biochemical studies of nitrogenous metabolites were made on samples of blood and urine from each of the two patients. Plasma amino nitrogen was determined by the ninhydrin-carbon dioxide method of Hamilton and Van Slyke[14]; urine amino nitrogen by the method of Van Slyke and associates[15]; urea by

14. Hamilton, P. B., and Van Slyke, D. D.: The Gasometric Determination of Free Amino Acids in Blood Filtrates by the Ninhydrin-Carbon Dioxide Method, J. Biol. Chem. **150**:231-250, 1943.

15. Van Slyke, D. D.; MacFadyen, D. A., and Hamilton, P. B.: The Gasometric Determination of Amino Acids in Urine by the Ninhydrin-Carbon Dioxide Method, J. Biol. Chem. **150**:251-258, 1943.

TABLE 1.—*Plasma and Urine Analyses of Patient S. C.*

	Plasma, Mg./100 Ml.	
	Patient (S. C.)	Normal Control (M)
June 8, 1960		
Amino nitrogen	1.68	1.85
Urea nitrogen	9.20	17.30
Methionine	0.50	0.30
Cystine	0.70	2.00
	Urine, 4-Hour Collection	
June 16, 1960		
Volume	100. ml.	60. ml.
Total nitrogen	283. mg.	387. mg.
Urea nitrogen	154. mg.	347. mg.
Amino nitrogen	31.8 mg.	3.7 mg.
Ratio amino nitrogen to total nitrogen × 100	11.3	0.9
Methionine	2.40 mg.	0.01 mg.
Cystine	19.00 mg.	0.09 mg.
Aminoacetic acid	36.70 mg.	3.60 mg.
Serine	14.40 mg.	1.92 mg.

TABLE 2.—*Analysis of Total Nitrogen, Amino Nitrogen, and Free Amino Acids in a Twenty-Four-Hour Urine Specimen from a Patient with Amino-Aciduria (J. A.) Compared with Values from a Normal 3-Year-Old Control*

	Mg./24 Hr.	
	Patient (J. A.)	Control
July 17, 1951		
Aminoacetic Acid	413	41.0
Glutamine	371	11.0
Histidine	235	49.0
Threonine	198	1.6
Lysine	159	2.0
Serine	140	5.0
Tyrosine	95	6.0
Proline	78	10.0
Valine	66	4.0
Alanine	59	1.5
Cysteine	55	10.0
Phenylalanine	33	3.0
Tryptophan	31	6.0
Arginine	23	3.0
Leucine	20	1.5
Aspartic acid	12	1.1
Methionine	12	0.2
Isoleucine	10	1.7
Glutamic acid	9	....
Amino nitrogen (calculated from above amino acids)	245.2	20.9
Amino nitrogen (by ninhydrin-carbon dioxide assay)	312.0	24.4
Total nitrogen (grams)	3.9	5.0
Ratio amino nitrogen (ninhydrin) to total nitrogen × 100	8.0	0.4
	Approximate 24-Hour Collection	
Feb. 27, 1952		
Amino nitrogen (by ninhydrin-carbon dioxide assay)	173.0	....
Urea nitrogen (grams)	1.74	....
Total nitrogen (grams)	2.50	....
Ratio amino nitrogen (ninhydrin) to total nitrogen × 100	6.9	....

the manometric method of Van Slyke and Kugel[16]; total nitrogen by a micro-Kjeldahl procedure,[17] and the individual amino acids by microbiological procedures as follows: arginine and threonine with medium of Henderson and Snell[18] and with Streptococcus faecalis (ATCC 1709) as the test organism; alanine, medium of Sauberlich and Baumann[19] with Leuconostoc citrovorum (ATCC 8081); glutamic acid and glutamine with Lactobacillus arabinosus (ATCC 8014) by the method of Harper[20]; cystine and cysteine by the method of Hutchin and associates[21] using Lactobacillus lycopersici (ATCC 4005); all other amino acids with the medium of Steele, Sauberlich, Reynolds, and Baumann[22] and with Leuconostoc mesenteroides P-60 (ATCC 8042) as test organism.

COMMENT

The biochemical data which we were able to obtain in these two cases indicate that the very high urinary amino nitrogen was due to a marked increase in the excretion of all amino acids that can be detected by microbiological assay. This differentiates these cases from the cases of cystinuria, and clearly characterizes the amino-acidurias as of the Fanconi type. However, the plasma amino nitrogen was normal, as were the plasma concentrations of those amino acids which were investigated. Dent[23] distinguishes two mechanisms for the production of amino-aciduria:

TABLE 3.—*Analysis of Plasma of Patient with Amino-Aciduria (J. A.) for Amino Nitrogen and Certain Amino Acids*

Feb. 1, 1952	Mg./100 Ml.
Amino nitrogen	4.46
Cysteine	2.54
Methionine	1.00
Lysine	5.85
Arginine	1.10
Threonine	2.10
Alanine	7.20
Histidine	4.00

the "overflow" type, which is caused by the presence of excessive amino acids in the blood, as in acute yellow atrophy of the liver, and the "renal" type, which produces a similar loss of amino acids in the urine without the accompanying elevation of blood amino nitrogen. These criteria serve to differentiate generalized impairment

16. Van Slyke, D. D., and Kugel, V. H.: Improvements in Manometric Micro-Kjeldahl and Blood Urea Methods, J. Biol. Chem. **102**:489-497, 1935.

17. Hiller, A.; Plazin, J., and Van Slyke, D. D.: A Study of Conditions for Kjeldahl Determination of Nitrogen in Proteins, J. Biol. Chem. **176**:1401-1420, 1948. Kirk, P. L.: A One-Piece Glass Micro-Kjeldahl Distillation Apparatus, Indust. & Engin. Chem. (Anal. Ed.) **8**:223-224, 1936.

18. Henderson, L. M., and Snell, E. E.: A Uniform Medium for Determination of Amino Acids with Various Microorganisms, J. Biol. Chem. **172**:15-29, 1948.

19. Sauberlich, H. E., and Baumann, C. A.: A Microbiological Determination of Alanine, J. Biol. Chem. **177**:545-50, 1949.

20. Harper, H. A.: The Microbiological Determination of Glutamine in Human Plasma, Arch. Biochem. **15**:433-38, 1947.

21. Hutchin, M. E.; Harper, H. A.; Margen, S., and Kinsell, L. W.: Microbiological Determination of Cystine, Cysteine, and Glutathione in Plasma, J. Biol. Chem. **185**:839-843, 1950.

22. Steele, B. F.; Sauberlich, H. E.; Reynolds, M. S., and Baumann, C. A.: Media for Leuconostoc mesenteroides P-60 and L. Citrovorum 8081, J. Biol. Chem. **177**:533-544, 1949.

23. Dent, C. E.: Mechanisms of Aminoaciduria, Federation Proc. **6**:390, 1947.

of amino acid metabolism from failure of renal tubular reabsorption. The two mechanisms seem entirely analogous to diabetes mellitus and renal diabetes. Rapoport [24] assumes that a generalized metabolic defect is involved in the amino-aciduria, but, with use of the criteria cited, it seems incorrect to assume other than renal tubular failure as the cause of the generalized amino-aciduria of the Fanconi type.

The persistent acidosis in these patients is probably a manifestation of the underlying renal disease. A decreased urea excretion is also characteristic: For example, as shown in Table 1, a urea nitrogen which is 55% of the total nitrogen, as compared with 90% in the control; and, in Table 2, a urea nitrogen which comprised 70% of the total nitrogen excreted during the collection period. It has been suggested that much of the amino nitrogen derived from deamination of amino acids rather than appearing as urea has been diverted to the production of ammonia to aid in the neutralization and excretion of acid and thus to conserve fixed base.

It has been noted that the nonprotein nitrogen of the plasma is normal early in the disease but rises later, and the first reports of this syndrome pointed out that all patients die in early life in uremia. It is, therefore, reasonable to assume that elevated plasma levels of amino acids would not be expected until full development of the renal failure, with which the disease usually terminates, becomes apparent. It has also been noted by several observers that cystine excretion declines late in the disease, presumably from failure of the damaged kidney to excrete it. Under these conditions, while all amino acids, along with other nitrogenous metabolites, would be elevated in the plasma, it would be expected that the conspicuous insolubility of cystine would lead to its deposition in the tissues in increased amounts, while other amino acids would remain dissolved in the tissue fluids. There are, however, several instances of the deposition of various metabolites in the tissues without prior elevation in the plasma. Thus, it is not necessary to assume that cystine storage occurs only in the terminal stages of the syndrome; in fact, it has been demonstrated by sternal puncture earlier in the course of the disease when the plasma amino acid levels were normal. Possibly the metabolic defect in this syndrome, while primarily renal in origin, also includes a local factor at the tissue site, which accounts for the deposition of cystine.

Our first case, which terminated fatally, was originally diagnosed as a classic overflow or renal type of amino-aciduria but at autopsy was found to exhibit the picture of cystinosis. In this instance, therefore, we have evidence that the amino-aciduria of the Fanconi type is accompanied by cystinosis. We do not yet have proof of cystine storage in the second case, but it will be of interest to follow the patient in this connection in order to support our belief that the two syndromes are actually different manifestations of the same disease entity. On the other hand, from the evidence already cited, it is apparent that the cystinuric patient excretes increased amounts of only a few amino acids; cystine, arginine, and lysine, and possibly one or two others. The remaining amino acids of the plasma are apparently normally reabsorbed. Until it can be demonstrated that such a cystinuric patient actually progresses to the development of a generalized amino-aciduria, it is felt that cystinuria and the Fanconi syndrome must be considered as separate disease entities.

24. Rapoport, M.: Inborn Errors of Metabolism, in Mitchell-Nelson: Textbook of Pediatrics, Ed. 5, Philadelphia, W. B. Saunders Company, 1950, p. 288.

In the accompanying Table 4 the pattern of 18 free amino acids in the plasma and in the urine, both examined in the fasting state, are compared by listing each acid in descending order of concentration. These data were obtained by one of us (H. A. H.) from studies of seven normal adult subjects, using microbiological methods of assay. It will be noted that the urine pattern differs from that of the plasma. This also holds true after intravenous infusion of amino acids.[25] Thus, it is apparent that the glomerular filtrate is altered by differential tubular reabsorption of the amino acids, with resultant alteration of the urinary pattern.

In Table 2 the amino acid pattern of an amino-aciduric patient (J. A.) and that of a normal control child of the same age are compared. Both the patient and the control subject present urinary amino acid patterns essentially identical with one

TABLE 4.—*Free Amino Acid Pattern of Plasma and Urine of Normal Adults*

	Plasma		Urine	
No.	Amino Acid	Range of Concentration, Mg./100 Ml.	Amino Acid	Range of Concentration, Mg. Excreted/Hr.
1.	Glutamine	4.6–8.3	Aminoacetic acid	3.0–18.0
2.	Lysine	3.0–5.7	Histidine	3.0–10.3
3.	Alanine	3.0–5.4	Glutamine	1.6– 3.6
4.	Valine	2.8–3.9	Serine	0.6– 2.6
5.	Leucine	1.7–3.6	Cysteine	0.4– 2.5
6.	Threonine	1.4–3.6	Threonine	0.2– 1.8
7.	Aminoacetic acid	1.2–3.4	Arginine	0.2– 1.8
8.	Proline	1.3–3.2	Tyrosine	0.3– 1.3
9.	Arginine	1.8–3.0	Phenylalanine	0.1– 1.3
10.	Histidine	1.6–2.6	Tryptophan	0.5– 1.2
11.	Cysteine	1.8–2.2	Lysine	0.1– 1.0
12.	Phenylalanine	1.1–2.2	Alanine	<0.1– 0.8
13.	Tryptophan	1.3–2.0	Valine	<0.1– 0.4
14.	Isoleucine	1.2–2.0	Proline	<0.1– 0.3
15.	Serine	0.9–2.0	Leucine	<0.1– 0.3
16.	Tyrosine	1.0–1.3	Isoleucine	<0.1– 0.3
17.	Glutamic acid	0.4–1.3	Methionine	<0.1– 0.2
18.	Methionine	0.3–0.8	Glutamic acid †	<0.1– 0.2
19.	Aspartic acid *	.....	Aspartic acid †	<0.1– 0.2

* Aspartic acid has not been found in the plasma.
† It has been shown by Dunn and co-workers [26] that some amino acids are excreted largely in a combined form. This is particularly true of aspartic and glutamic acids. In these assays only the "free," or microbiologically available, amino acids were measured.

another, as well as with the expected pattern from the data on normal adults, in that aminoacetic acid, histidine, and glutamine are excreted in the largest amounts and methionine, the leucines, and the dicarboxylic acids are excreted in much smaller quantities. This suggests that the kidney of the amino-aciduria patient is capable of some tubular reabsorption of amino acids, since the plasma amino acid pattern is actually modified as it is in normal persons. Thus, the syndrome constitutes a quantitative rather than a qualitative impairment.

It is of interest to note that in Patient J. A. (Table 2) the content of urinary amino nitrogen determined by direct analysis, using the ninhydrin-carbon dioxide method, was considerably higher than that calculated from the 19 amino acids for

25. Harper, H. A.: Intravenous Amino Acid Tolerance Studies in Humans, Proc. Soc. Exper. Biol. & Med. **72**:184-187, 1949.

which microbiological assay methods have been developed. This excess amino nitrogen possibly represents combined or microbiologically unavailable amino acids,[26] as well as metabolites of amino acids such as ornithine and taurine and alpha amino butyric acid, a presumed metabolite of methionine identified by Dent in the chromatograms from a patient with the Fanconi syndrome as well as from urines from normal persons.[9]

In the cases which Dent reported [9] the excretion of amino acids in the urine was related to that of glucose by a straight-line relationship, although the quantities of each excreted from day to day varied considerably. It is possible that this relationship between amino acid and glucose excretion reflects the conversion of glycogenic amino acids to sugar as shown by Lusk [27] in the phlorhizinized dog, in which the feeding of protein was found to increase the excretion of sugar. Such conversion of amino acids to sugar (gluconeogenesis) is a function of the liver, and the ability of gluconeogenesis to proceed in these patients argues against a generalized metabolic defect as a factor in the pathogenesis of this syndrome.

From our data it is suggested that the biochemical diagnosis of generalized amino-aciduria is best initiated by analysis of the urine for amino nitrogen, which is invariably elevated about 10 times that of a normal subject of the same age, and the finding of normal plasma amino nitrogen levels. Since the amino acid excretion can be expected to vary not only from day to day but also with the age of the subject, it is desirable to express the amino-aciduria in terms of its relationship to the total nitrogen excreted. Dent [9] states that on the basis of his studies the amino nitrogen excretion is to be considered abnormal in quantity if it exceeds 3% of the total nitrogen. In our two cases, the amino nitrogen excretion of the normal controls ranged between 0.4 and 0.9% of the total nitrogen, as compared with 11.3% in the patients. The biochemical differentiation of the Fanconi syndrome from cystinuria is easily made by analysis of the urine for certain amino acids which will be elevated in the patient with generalized amino-aciduria but not in the cystinuric patient, namely aminoacetic acid, glutamine, histidine, and threonine, to select those present in the largest quantity. Further observations of these patients should define more precisely the suggestion that the generalized amino-aciduria of the Fanconi syndrome and cystine storage disease (cystinosis) are actually different manifestations of the same disease entity.

SUMMARY AND CONCLUSIONS

Two cases of generalized amino-aciduria in children have been studied. In both cases the condition differed from typical cystinuria in that all amino acids measured microbiologically in the urine were markedly elevated. One of the cases terminated fatally, and at autopsy cystine storage disease (cystinosis) was found. From these studies it is felt that these cases are representative of a generalized amino-aciduria (Fanconi syndrome) which should be differentiated from cystinuria. On the other hand, it is likely that cystinosis is actually another aspect of the Fanconi syndrome.

26. Dunn, M. S.; Camien, M. N.; Shankman, S., and Block, H.: Urinary Excretion of 12 Amino Acids by Normal Male and Female Subjects Measured Microbiologically, Arch. Biochem. **13**:207-216, 1947.

27. Lusk, G.: The Elements of the Science of Nutrition, Ed. 3, Philadelphia, W. B. Saunders Company, 1919, p. 455.

The elevated urine amino acids were not accompanied by increased plasma levels of amino nitrogen or of the individual amino acids, and, unless cystine storage be so considered, no evidence of impairment of amino acid metabolism was elicited in these cases other than a renal tubular defect.

Although the excretion of amino acids in the patients with amino-aciduria was uniformly increased over that of a control subject, the amino acid pattern of their urine was essentially the same. Furthermore, as is also the case in normal subjects, the amino acid pattern of their urine differed from that of their plasma—a differentiation which is accomplished only through modification of the glomerular filtrate by selective renal tubular reabsorption. This indicates that the generalized amino-aciduria is a manifestation only of a reduced capacity rather than a total failure of amino acid reabsorption in the renal tubule.

The biochemical diagnosis of a generalized amino-aciduria of the Fanconi type can be made by the finding of urinary amino nitrogen which exceeds 3% of the total nitrogen and elevated urine levels of those amino acids which are normal in cystinuria. Plasma amino nitrogen levels should remain normal, except possibly in the terminal stage of the disease.

The roentgen findings in both cases are described in some detail. In both cases there was generalized demineralization of the skeleton, and in one of them, the rachitic changes which have been previously described in this syndrome.

In addition, both patients initially showed large spurs arising from the cortex of the metaphyses, some of which had vertical lines of radiolucency which resembled fractures through their bases.

Drs. F. S. Smyth and W. C. Deamer made helpful suggestions during the study of these cases. Dr. Bradford King supplied the pathological material on Patient S. C. Maxine E. Hutchin and Charles J. Rogers, Metabolic Research Facility, United States Naval Hospital, Oakland, Calif., provided technical assistance in obtaining some of the chemical data reported in this article.

Case Reports

RARE MALFORMATION OF URETHRA AS A CAUSE OF CONGENITAL OBSTRUCTION OF LOWER URINARY TRACT

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THIS PAPER reports a case of incomplete duplication of the urethra as a cause of urinary obstruction. Congenital obstruction of the urethra is a rare finding at autopsy. In a series of 32,360 autopsies, Bell [1] encountered this condition only 8 times, and Campbell [2] found it 23 times in 12,080 autopsies. No pathological description similar to the present observation was included in these series nor in a review of 83 cases of duplication of the urethra reported by Gross and Moore.[3]

REPORT OF CASE

Clinical History.—A boy infant was delivered from a 19-year-old primipara during the seventh month of pregnancy. The infant died three hours after birth. The previous history of the mother was not contributory.

Pertinent Postmortem Findings.—The body was that of a premature infant, 43 cm. in length, 900 gm. in weight, with mongoloid features, cryptorchism, and clubfeet. There was cyanosis of the skin and lips. The findings in the urogenital tract are presented in Figure 1.

Kidneys: The kidneys were enlarged and, grossly and histologically, revealed the characteristic lesions of congenital polycystic disease. The papillae of the kidneys were flattened, and the pelves were distended.

Ureters: Both ureters were considerably dilated and tortuous. Their diameters gradually increased distally to 2 to 3 cm. before entry into the bladder wall. They had thin walls and contained a yellowish fluid. The ureteral orifices were patent.

Bladder: The bladder was distended and its walls thickened, particularly in the fundus. The region of the trigonum was extremely dilated, posteriorly forming a diverticulum-like sac, enclosing the trigonum as well as the prostatic portion of the urethra.

Testicles: These were found on the lateral sides of the ureters, in their distal third.

Penis: In sections through the penis the urethra seemed to be patent throughout, and no cause of the urinary retention was detected by macroscopic examination.

The posterior part of the urethra was divided into 10 blocks which were cut in serial sections (Fig. 2). Sections through the proximal end of the membranous portion of the urethra showed, upon microscopic examination, a large crescent-shaped channel, lined by transitional epithelium and surrounded by concentric layers of collagenous fibers, venous sinuses, and smooth muscle fibers (Fig. 2*a*). On the ventral portion of this channel there was an eminence which included a second, very narrow, oval-shaped channel, separated from the larger channel by a thin layer of connective tissue fibers and surrounded by venous sinuses. This narrow duct was also lined with transitional epithelium.

Serial sections of the more distal parts of the membranous portion of the urethra (Fig. 2*b* to *h*) revealed a gradual decrease in the diameter of the dorsal channel and filling of its

From the Department of Pathology, The Hebrew University-Hadassah Medical School.

1. Bell, E. T.: Renal Diseases, Philadelphia, Lea & Febiger, 1946.
2. Campbell, M. F.: Pediatric Urology, New York, The Macmillan Company, 1937.
3. Gross, R. E., and Moore, T. C.: Duplication of the Urethra, Arch. Surg. **60**:749, 1950.

lumen by desquamated epithelial cells (Fig. 2*e* and *f*). At the level of the distal end of the membranous portion the channel ended blindly in a small nodule of dense fibrous tissue (Fig. 2*g*).

From the very beginning, there was a gradual increase in the diameter of the ventral channel. In the distal direction it became slightly displaced from the dorsal channel and completely surrounded by several layers of venous sinuses. At the distal end of the membranous urethral portion, the ventral channel finally attained the form and size of a normal urethra (Fig. 2*h*).

Anatomical diagnosis.—The diagnosis was as follows: duplication of the urethra in the membranous portion, with an accessory dorsal urethral channel and extreme narrowing of the

Fig. 1.—General view of the urogenital tract showing polycystic kidneys, hydroureters, and hypertrophy of the bladder.

main urethra near the origin of the accessory channel; hydroureter, bilateral; hypertrophy of the bladder; polycystic kidneys; cryptorchism; mongolism; clubfeet.

COMMENT

In this case the urethra was divided in its membranous portion into a short dilated dorsal duct with a blind ending and a ventral true urethra with extreme narrowing of the lumen at the site of branching of the dorsal channel (Fig. 3). The urinary obstruction seemed to be the result not only of anatomical constriction of the urethra, but also of its compression by the dilated accessory dorsal blind channel.

Fig. 2.—Serial sections through the membranous portion of the urethra; distance between consecutive sections about 200 μ.

A previous report of this anomaly as a cause of obstruction was not found in the literature, except for a clinical observation by Purcell.[4] This author observed in a 54-year-old man, during endoscopic examination, a short accessory urethra issuing from the roof of the urethra, which caused acute urinary retention and pressure on the true urethra by distention.

A case reported by Frontstein and Saigrajeff [5] revealed slight similarity to the present case, showing a duplication of the urethra without signs of urinary obstruction. In this case, however, the true urethra was only slightly narrowed; the dorsal channel was longer than in my case and terminated blindly in the pendulant part of the penis.

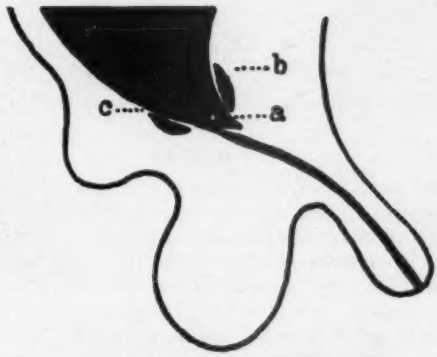

Fig. 3.—Diagrammatic reconstruction of the malformation in lateral view: *a*, accessory urethral channel; *b*, prostate; *c*, dilated prostatic portion of the urethra.

SUMMARY

A case is reported of a premature infant with multiple congenital malformations: mongolism, polycystic kidneys, cryptorchism, clubfeet, and signs of urinary retention in the lower urinary tract. The urinary retention was caused by duplication of the urethra in the region of its membranous portion, by congenital constriction of the true urethra, and by its compression from a dorsally situated blind accessory tract.

Dr. H. Ungar, Head of the Department of Pathology, The Hebrew University-Hadassah Medical School, gave helpful suggestions.

4. Purcell, H. M.: Another Cause of Urinary Obstruction, J. Urol. **62**:748, 1949.

5. Fronstein, R., and Saigrajeff, M., cited by Priesel, A.: Männliche Geschlechtsorgane, in Henke, F., and Lubarsch, O.: Handbuch der speziellen pathologischen Anatomie und Histologie, Berlin, Springer Verlag, 1931, Vol. 6, Pt. 3.

ACCIDENTAL INHALATION OF AN AUREOMYCIN CAPSULE

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THE FOLLOWING brief case report is being presented for two reasons: (1) It afforded an unusual opportunity to observe the effects of the antibiotic aureomycin on the mucous membrane of the tracheobronchial tree, and (2) it will serve to point out again certain dangers inherent in capsule or tablet medication of an infant.

REPORT OF A CASE

D. A., a 9-month-old white boy, was admitted to Strong Memorial Hospital on April 7, 1952. Approximately 36 hours previous to his admission medication with an aureomycin capsule was attempted, the capsule having been included in the child's orange juice. When the child failed to take the capsule, the mother attempted to force swallowing by pushing the capsule back over the tongue with her finger. As this was done, the patient suddenly choked, coughed, and became temporarily cyanotic. As soon as the acute spasm of coughing and cyanosis ceased, he seemed to be alright except for wheezing. At about this point one-half of the capsule was found. Wheezing and increasing respiratory distress persisted until he was admitted to the hospital.

Physical examination on admission to the hospital revealed a well-nourished boy of 9 months who was in acute distress. Respirations were rapid (45 a minute), temperature was 38 C. (100.4 F.) and pulse rate was 120. Retraction of the interspaces and sternal notch was noted, but cyanosis was minimal. Auscultation revealed coarse rhonchi and wheezing over the whole pulmonary field without marked change on percussion. The laboratory studies revealed a white blood cell count of 15,450 with a normal differential count. The urine was normal.

On the basis of the history and physical findings a diagnosis of pulmonary foreign body was entertained and an x-ray of the chest obtained, which showed increased bronchial markings but no evidence of atelectasis or emphysema (Fig. 1).

Bronchoscopy was delayed several hours until an operative permit could be obtained. Actual instrumentation was carried out about 46 hours after the accident.

Operative Note.—A 4 mm. bronchoscope passed direct without difficulty. Laryngeal structures were of normal contour and moved freely. Mucous membranes of the trachea, region of the carina, and both main bronchi were stained bright yellow. Edema of the mucous membranes in the lower third of the trachea, region of the carina, and the openings of both main bronchi was extremely severe, so severe as to reduce the lumen of the main bronchi to about 2 mm. Secretion was excessive and bright yellow and contained granular yellow particles. The missing half of the capsule was not found. Extensive deep aspiration was carried out to remove as much of the yellow foreign material (aureomycin) as possible.

Postoperative Course.—The hospital course following bronchoscopy and aspiration was uneventful. A chest x-ray (Fig. 2) on the third postoperative day showed considerable clearing, and this was confirmed by auscultation, only an occasional wheeze being heard.

From the Department of Surgery, Division of Otolaryngology (Dr. Emerson), and the Department of Pediatrics (Dr. Bradford), University of Rochester School of Medicine and Dentistry.

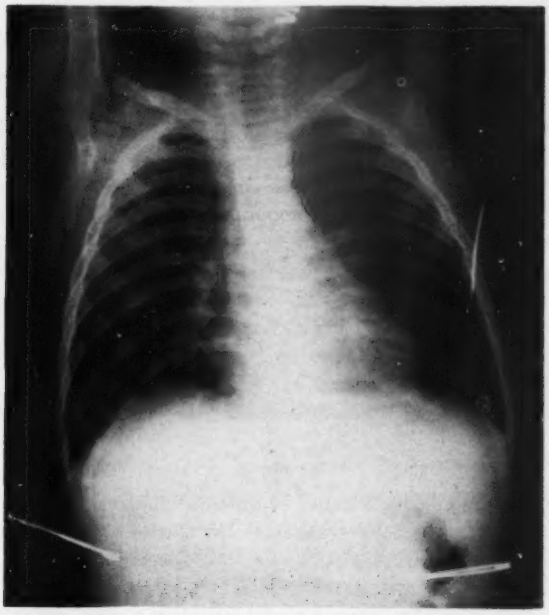

Fig. 1.—Roentgenogram of chest taken 36 hours after inhalation of aureomycin.

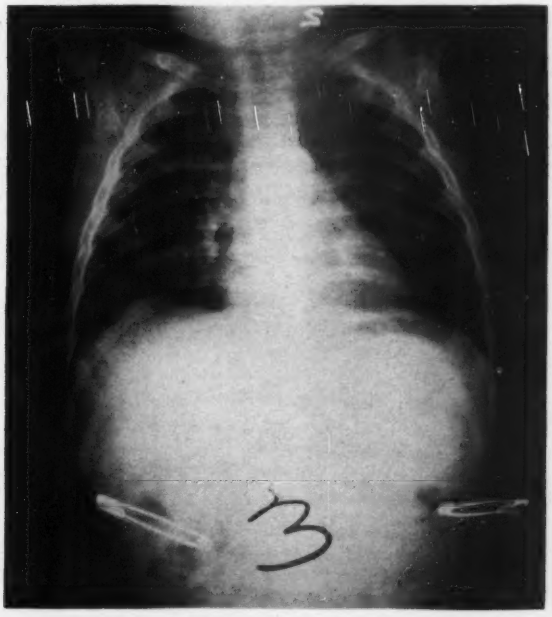

Fig. 2.—Roentgenogram of chest taken 72 hours after removal of as much aureomycin as possible by bronchoscopy.

COMMENT

It is worth noting the severe irritative reaction of the tracheobronchial mucous membranes to aureomycin. This might well be expected if one remembers the reaction of the peritoneal surface to this antibiotic and the mucous membranes of the mouth and rectum in some persons. Thus, it appears that aureomycin in its present form is hardly satisfactory for direct intrapulmonary medication.

Secondly, medication of the infant with tablets and capsules is not without certain dangers. My pediatric contemporaries reveal that it is not an uncommon practice among both pediatricians and general practitioners to instruct mothers to administer tablets and capsules by pushing them far back on or even over the tongue into the hypopharynx proper. If this is so, one wonders why such accidents as noted above are not commoner, and perhaps they are, but because of the fact that the medications happen to be harmless i. e., dissolve without serious complication, such cases do not come to the attention of the endoscopist. It does appear certain, however, that this is not the technique of choice when the medication is aureomycin or when the capsule contains oil.

SUMMARY

A case of inhalation of a capsule of aureomycin is reported. The effect of the antibiotic on the mucous membranes of the tracheobronchial tree as observed by direct vision is recorded.

A plea for care when instructing mothers of infants in the art of medication is made. It is suggested that whenever one is dealing with a small infant and some other mode of administration is available tablets or capsules not be given by the oral route.

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CONGENITAL HYPOPLASTIC ANEMIA ASSOCIATED WITH MULTIPLE DEVELOPMENTAL DEFECTS (FANCONI'S SYNDROME)

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AND
LEDA ZANNOS, M.D.
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FANCONI [1] in 1927 first described a syndrome in three brothers, aged 3, 5, and 7 years, respectively, who had aplastic anemia, microcephaly, testicular hypoplasia, strabismus, exaggerated deep-tendon reflexes, and a generalized brown melanin-like pigmentation of the skin. This syndrome is characterized by multiple congenital malformations associated with hypoplastic anemia.

The congenital defects most frequently seen are retardation of growth and development; multiple anomalies of the skeleton, especially absence of radius, thumbs, and carpal bones; syndactyly; microcephaly; microphthalmia; ptosis; strabismus; congenital heart disease; hypogenitalism; cryptorchism, and hypospadiasis.

The blood has the characteristics of hypoplastic anemia, with normocytic and normochromic red blood cells. The leucocyte count shows a neutropenia, with leucocytes being usually less than 5,000 per cubic millimeter. The platelets are usually below 50,000 per cubic millimeter. The bone marrow is hypoplastic. The skin often has a dark color with areas of brown pigmentation.

The disease has a progressive course. Treatment with iron compounds, liver extracts, or folic acid is ineffectual. Blood transfusions are temporarily beneficial. Other cases of a familial or sporadic character have appeared in the literature since Fanconi's first description of the syndrome.[2]

The purpose of this paper is to describe another case of Faconi's syndrome in a Greek boy. This is the first such case to be reported in Greece.

REPORT OF A CASE

L. K., a 5-year-old boy, was admitted to the Children's Hospital of Athens University on Feb. 23, 1941, with a history of high temperature of 20 days' duration, yellow discoloration of the skin, dark color of the urine, and clay-colored stools for the first 10 days of the illness.

Read before the Greek Pediatric Society, June 26, 1951.

From the Pediatric Clinic, Athens University (Constantine Choremis, M.D., Director); Registrar (Dr. Cassimos) and Resident Medical Officer (Dr. Zannos), Children's Hospital, Athens University.

1. Fanconi, G.: Jahrb. Kinderh. **67**:257, 1927.

2. Uehlinger, E.: Klin. Wchnschr. **8**:1501, 1929. van Leeuwen, H. C.: Folia haemat. **49**:434, 1933. Weil, P. E.: Sang **12**:369, 1938. Zellweger, H, and Zollinger, H. U.: Helvet. paediat. acta **1**:382, 1946. Hjorth, P.: Nord. med. (Hospitalstid.) **7**:1313, 1940. Dacie, J. V., and Gilpin, A.: Arch. Dis. Childhood **19**:155, 1944. Jimenez de Asua, P., and Escardo, F.: Rev. chilena pediat. **18**:977, 1947. Estren, S.; Suess, S. F., and Dameshek, W.: Blood **2**:58, 1947. Rohr, K.: Ibid. **4**:130, 1949. Adams, E. B.: Lancet **1**:657, 1951. Baumann, T.: Ann. pædiat. **177**:65 and 142, 1951.

Family History.—Both parents came from the area of Thebes (Attica), where the patient was born. The mother had had two stillbirths and six normal deliveries. The patient was the fifth child in the family. Two of the other children died at the age of 4 days from an unknown disease, and a girl died at the age of 6 years of anemia. According to the parents, this girl had been jaundiced for a while and died after repeated hematemesis and hemoptysis. The blood of the father and of a brother showed hypochromic anemia, anisopoikilocytosis, and target cells. The erythrocyte fragility of the father was 0.44 to 0.20% and that of the brother 0.40 to

Fig. 1.—Photographs of Greek boy with Fanconi's syndrome.

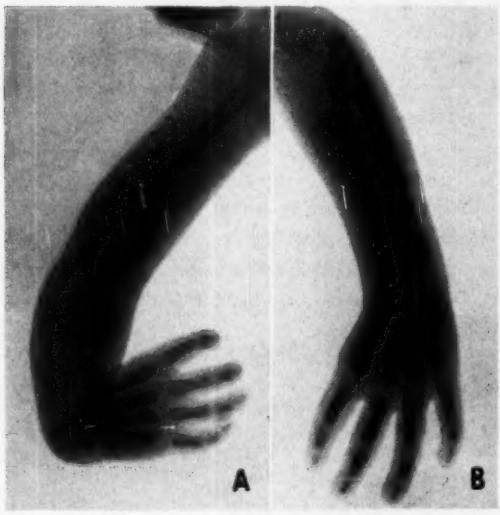

Fig. 2.—Roentgenograms of hands and arms; *A*, right; *B*, left.

0.16%. These findings are consistent with Cooley's anemia. The blood of the mother and sister showed no abnormalities.

Patient's History.—Pregnancy and delivery were normal. After birth it was noted that both thumbs were absent, that the right forearm was hypoplastic, and that the right hand deviated internally. According to the parents the boy's physical development was retarded but mentally he developed normally. He had bronchopneumonia at the age of 7 months.

Clinical Data.—Upon admission the child was very pale and dyspneic. He looked very small for his age and had the following body measurements: height, 89 cm.; body weight, 11 kg.; head

circumference, 46 cm.; chest circumference, 48 cm. His eyes looked smaller than normal. Multiple bilateral retinal hemorrhages were found upon examination of the fundi. The right forearm was hypoplastic, the right hand was deviated to the ulnar side, and both thumbs were absent. Upon examination of the respiratory system, dry and moist rales were heard over the entire chest, especially at the bases, suggesting a diagnosis of bronchopneumonia. Systolic murmurs were evident at the apex and base of the heart. The heart size was normal. The spleen was not palpable. The liver was enlarged 2 fingerbreadths under the costal line; it was smooth and not tender. The color and consistency of the stools were normal, and the genitalia were normal. The skin had a dark color, with few areas of brown pigmentation on the chest, thighs, and arms.

Laboratory Data.—Upon admission the hemoglobin was 18%, the red blood cell count was 1,200,000 per cubic millimeter, and the white blood cell count was 6,000 per cubic millimeter. There were 70,000 platelets per cubic millimeter and 0.5% reticulocytes. The differential distribution was as follows: 2% metamyelocytes, 2% band-form cells, 2% neutrophilic polymorphonuclear leucocytes, 57% lymphocytes, and 1% normoblasts. The red blood cells were hypochromic, with slight variation in size, 5 to 6% target cells, and rare polychromatophilia.

The bone marrow, aspirated from three different sites, was very hypocellular, with the following content: 1% myeloblasts, 4% promyelocytes, 8% myelocytic eosinophiles, 19% metamyelocytes, 1% band-form cells, 16% neutrophiles, 2% eosinophiles, 19.5% lymphocytes, 0.5% proerythroblasts, and 28% normoblasts (basophilic, polychromatophilic, and acidophilic). The ratio of white to red cells was 2.5, and megakaryocytes were decreased in number.

The coagulation time was five minutes, and the bleeding time, four minutes and 30 seconds. The results of a test for Rumpel-Leede phenomenon were negative, as were a Coombs test for antibodies in the blood and a test for sickling of red cells. The prothrombin time was 13 seconds (control, 12 seconds).

Urinalysis disclosed a trace of albumin, the presence of urobilinogen, and no sugar, bile salts, or bile pigment. The erythrocyte sedimentation rate (Westergren) was 178 mm. in the first hour and 180 mm. in the second hour. The electrocardiogram was normal, and the Mantoux reaction (1:1,000) was negative. The total serum protein was 8 gm. per 100 cc., with an albumin globulin ratio of 3.7:2.9; the blood cholesterol was 171 mg. per 100 cc., and bilirubin, 0.8 mg. per 100 cc.

Blood cultures were negative. No malarial parasites were found in the blood, and no Leishmania in the bone marrow. The Wassermann reaction was negative. Results of liver function tests were as follows: cephalin-cholesterol, +4; colloidal gold, +4; thymol turbidity, +18; thymol flocculation, +3; zinc sulfate turbidity, over 20. Roentgenograms of the chest and the skull were normal. Roentgenograms of the upper extremities showed absence of both thumbs, absence of the right radius, and a hypoplastic right ulna. The center of ossification of the epiphysis of the lower end of the left radius was absent.

Clinical Course.—Diagnoses of acute bronchitis and infectious hepatitis were made, and a high protein diet was prescribed. On the day of admission penicillin treatment was started, with six doses of 150,000 units each being administered. The fever was reduced to low levels, but a slight elevation of temperature persisted for about a month. The temperature then became normal, but occasional bouts of fever, with temperature rising to 37.4 to 37.6 C. (99.3 to 99.7 F.) persisted until the time of discharge. The chest findings cleared up in a few days, but the liver remained enlarged. The erythrocyte sedimentation rate fell gradually; upon discharge it was 39 mm. in the first hour and 60 mm. in the third hour. Abnormalities in liver function persisted throughout the hospital stay, and urobilinogen was always found in the urine.

Besides penicillin, the following medication was used: sulfamezanthine, intravenously and orally, at intervals; folic acid, 20 mg. daily for 32 days; liver extract, 1 cc. a day for 9 days, and vitamin K, throughout the hospital stay. Small blood transfusions, to a total of 1,150 cc., were also administered. During the last two months the hemoglobin remained at 40% without transfusions. The general condition improved slightly.

Findings upon Discharge.—At the time of discharge the hemoglobin was 4.55 gm., which is about 36% if 12 gm. may be considered normal for a Greek child of poor economic status. The red blood cell count was 2,400,000, and the white blood cell count was 4,000, with the fol-

lowing differential distribution: 26% polymorphonuclear leucocytes, 72% lymphocytes, and 2% eosinophiles. The hematocrit reading was 15%. There were 0.6% reticulocytes and 28 platelets per 1,000 red blood cells.

Bone marrow punctures repeatedly showed the same hypocellularity, with a normal ratio of white to red cells (3:5). Upon discharge the distribution in the bone marrow was as follows: 3% myeloblasts, 4% promyelocytes, 6% myelocytes, 2% eosinophilic myelocytes, 19% metamyelocytes, 2.5% band-form cells, 16% neutrophiles, 1% eosinophiles, 24% lymphocytes, 1.5% proerythroblasts, and 20% normoblasts (basophilic, polychromatophilic, and acidophilic). The serum bilirubin was 0.7 mg. per 100.

The patient was discharged on Aug. 7, 1951, almost five months after admission to the hospital. His condition had certainly improved, more as far as the anemia was concerned and less from the point of view of the liver disease. One could not tell whether the hemoglobin level would remain at 30 to 40% for a long time without transfusions. For the last two months he did not receive transfusions in the hospital. It is almost two months since he left the hospital, that is, four months since the last transfusion, and we have not heard of him since.

COMMENT

In brief, our patient showed multiple congenital defects, which, together with the brown pigmentation of the skin and the findings from the blood and bone marrow, justify us in considering this case as an example of Fanconi's syndrome. The slight hypochromia, the anisocytosis, the polychromatophilia, and the presence of target cells not commonly seen in the hypoplastic anemia may be traits of Cooley's anemia. This supposition is supported by the fact that the patient's father and brother also showed the traits. Rohr, also, detected Cooley's trait in two young adult brothers with this syndrome, who, in addition, presented anisopoikilocytosis, and he raises the question of the existence of some hereditary relation between Cooley's anemia and Fanconi's syndrome.

Considering the rarity of Fanconi's syndrome and the frequent occurrence of Cooley's anemia in Greece, we think that the simultaneous occurrence of the two is probably a coincidence. Yet the question arises, do the traits of Cooley's anemia influence the clinical and hematologic picture as well the course in Fanconi's syndrome?

What is the role of hepatitis in precipitating the disease? According to the parents, the child was in a good condition before the present illness. Bomford and Rhoads [3] think that the impairment of liver function may be an important precipitating factor in plastic anemia. We have recently seen a girl of 12 years with aplastic anemia which became evident shortly after an attack of infectious hepatitis. Probably toxic substances, endogenous or exogenous, not neutralized because of the liver damage, act upon the already-defective bone marrow.

SUMMARY

A case of Fanconi's syndrome is reported.

The association with the trait of Cooley's anemia and the possible initiation of the anemia by the liver damage is discussed.

3. Bomford, R. R., and Rhoads, C. P.: Quart. J. Med. **10**:175, 1941.

WATER INTOXICATION

Report of Case in Which Cumulative-Chloride-Balance Data Aided Diagnosis and Therapy

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AND
BELDING H. SCRIBNER, M.D.
ROCHESTER, MINN.

AFTER the development of a practical clinical method for measuring chloride balance,[1] this technic was applied to pediatric patients in order to evaluate it as a diagnostic aid and therapeutic guide in the parenteral administration of fluid and electrolyte. The results of this preliminary study will be published later. This report is of a case of water intoxication in which the cumulative-chloride-balance study was believed to contribute to the diagnosis and therapy.

REPORT OF CASE

A 7-month-old girl infant who weighed 8,800 gm. and was 72 cm. long was hospitalized because of exstrophy of the urinary bladder. Physical examination revealed a well-developed and well-nourished infant with no additional abnormalities. Preoperative blood chemistry determinations, including a value for blood urea of 38 mg. per 100 cc., were within normal limits. A cumulative-chloride-balance study was started at 11 a. m. on July 18, 1950, when the infant had just been returned to the nursery after bilateral ureterosigmoidostomy had been carried out for exstrophy of the urinary bladder. Her clinical course was uneventful for 24 hours after operation. She was receiving a 5% solution of dextrose in water in liberal but seemingly reasonable amounts in order to ensure the production of a large volume of urine. About 30 hours postoperatively she became listless, took her feeding poorly, and vomited once soon afterward. She then became unresponsive, and about 31 hours after operation clonic twitching of the muscles of the right side of the face developed. This focal twitching rapidly spread to involve the entire right side of the body and then became generalized, despite the administration of 1 grain (0.065 gm.) of phenobarbital sodium subcutaneously and 5 cc. of 10% solution of calcium gluconate intravenously. At that time the axillary temperature was 100.4 F., the pulse rate was 160 per minute, and respirations were 72 per minute. The volume of urine for the first 24 hours was only 145 cc., suggesting water depletion to the clinicians managing the patient. The intravenous administration of a 5% solution of dextrose in water was discontinued and a 10% solution substituted for it. At 11 p. m., or about 36 hours after operation, the following clinical condition was observed.

The pulse rate was 180 per minute, the axillary temperature was 95.8 F., the blood pressure was 95 mm. of mercury systolic and 40 mm of mercury diastolic, and the respirations were 72 per minute. The patient was comatose. She had continuous generalized clonic convulsions and occasional regurgitation of minimal amounts of coffee-ground material. There was absence of

Fellows in Pediatrics (Dr. Baskin) and Fellow in Medicine (Dr. Scribner), Mayo Foundation, University of Minnesota, from the Section of Pediatrics, Mayo Clinic (Dr. Keith).

1. (*a*) Scribner, B. H.: Bedside Determination of Chloride: A Method for Plasma, Urine and Other Fluids and Its Application to Fluid Balance Problems, Proc. Staff Meet., Mayo Clin. **25**:209-218 (April 26) 1950. (*b*) Scribner, B. H.; Power, M. H., and Rynearson, E. H.: Bedside Management of Problems of Fluid Balance, J. A. M. A **144**:1167-1174 (Dec. 2) 1950.

response to any stimulus. The heart sounds were rapid but not otherwise remarkable. Auscultation of the lungs revealed clear breath sounds throughout. As well as could be determined, there was no nuchal rigidity. Other physical findings were noncontributory.

Emergency blood chemical determinations were 16.1 mEq. of bicarbonate per liter, 87.4 mEq. of chloride per liter, and 27 mg. of urea per 100 cc. (Tables 1 and 2). The volume of urine had increased from 145 cc. (Table 1) in the first 24 hours to 270 cc. (Table 2) in the last 12 hours.

Because of the increasing volume of urine and only a moderate lowering of the level of serum electrolyte, it did not appear to those in charge of treatment that water imbalance was

TABLE 1.—*Cumulative Chloride Balance Data for the First Twenty-Four Hours After Operation**

From 11 a. m., July 18, 1950, to 11 a. m., July 19, 1950; equals 24 hr.

Intake†			Output				
					Chloride, mEq.		
Volume, Cc.	Fluid	Chloride, mEq.	Volume, Cc.	Fluid	Per Liter	Total	pH
135	Oral	0	145	Urine plus stool	8	1	8.5
450	5% dextrose in water	0	200	Insensible‡	..	..	...
150	Saline irrigation by tube	23	157	Irrigation returned	149	23	7.5
—		—	—		—	—	—
735	Totals	23	502	Totals	..	24	...

* Daily balance: water, +233 cc.; chloride, −1 mEq.; cumulative chloride balance, −1 mEq.
† Water of oxidation and "preformed" water were ignored.
‡ Insensible water loss was estimated at 500 cc. per square meter per 24 hours.[2a] Surface area of the patient, 0.4 sq. m., was calculated from nomogram devised by R. R. Hannon [2b] from the formula of Du Bois and Du Bois for the estimation of surface area in children.

TABLE 2.—*Cumulative Chloride Balance Data for the Period Twenty-Four to Thirty-Six Hours After Operation**

July 19, 1950: Plasma bicarbonate, 16.1 mEq.; plasma chloride, 87.4 mEq.; cumulative chloride balance, −1 mEq.
From 11 a. m., July 19, 1950, to 11 p. m., July 19, 1950; equals 12 hr.

Intake†			Output				
					Chloride, mEq.		
Volume, Cc.	Fluid	Chloride, mEq.	Volume, Cc.	Fluid	Per Liter	Total	pH
135	Oral	0	270	Urine plus stool	3	1	8.5
500	5% dextrose in water	0	150	Insensible‡	..	4	...
100	10% dextrose in water	0	70	Emesis	100	7	...
45	Water irrigation	0	49	Irrigation returned	2	0	7.5
—		—	—		—	—	—
780	Totals	0	539	Totals	..	12	...

* Daily balance: Water, +241 cc.; chloride, −12 mEq.; cumulative chloride balance, −13 mEq.; cumulative water balance, +474 cc.
† Water of oxidation and "preformed" water were ignored.
‡ Insensible water loss was estimated at 500 cc. per square meter per 24 hours.[2a] Sensible water loss (50 cc. in 12 hours) with appropriate chloride content (70 mEq. per liter) [1b] was estimated from observation, and this was added to the calculated insensible water loss. Chloride content of sweat in infants may be significantly lower than that of adults, as suggested by Cooke and others.[2c]

2. In the computation and evaluation of some of the data in the tables the techniques of the following investigators have been used: (*a*) Lowe, C. U.; Rourke, M.; MacLachlan, E., and Butler, A. M.: Use of Parenteral Potassium Therapy in Surgical Patients: Its Role in Preventing Chloride Loss, Pediatrics **6**:183-191 (Aug.) 1950. (*b*) Hannon, R. R., cited in Mitchell-Nelson Textbook of Pediatrics, edited by W. E. Nelson, Ed. 5, Philadelphia, W. B. Saunders Company, 1950, p. 1618. (*c*) Cooke, R. E.; Pratt, E. L., and Darrow, D. C.: Influence of Heat on Water and Electrolyte Balance of Infants, Am. J. Dis. Child. **79**:1128-1129 (June) 1950.

the cause of the convulsions. Yet no other cause could be found. As a result, we were consulted because we were collecting cumulative chloride-balance data on the patient as part of a special study. When these data (Tables 1 and 2) were examined, they revealed a cumulative

TABLE 3.—*Cumulative Chloride Balance Data for the Period Thirty-Six to Forty-Eight and One-Half Hours After Operation**

July 20, 1950: Plasma bicarbonate, 22 mEq.; plasma chloride, 96.2 mEq.; cumulative chloride balance, −13 mEq. on July 19, 1950
From 11 p. m., July 19, 1950, to 11:30 a. m., July 20, 1950; equals 12½ hr.

Intake†			Output				
					Chloride, mEq.		
Volume, Cc.	Fluid	Chloride, mEq.	Volume, Cc.	Fluid	Per Liter	Total	pH
0	Oral	0	156	Urine plus stool	2	0	9.0
150	10% dextrose in 2% saline	51	100	Insensible‡	..	..	...
75	Blood	6	25	Stool, formed	..	..	...
50	Water irrigation	..	57	Irrigation returned	2	0	...
275	Totals	57	338	Totals	..	0	...

* Daily balance: Water, −63 cc.; chloride, +57 mEq.; cumulative chloride balance, +44 mEq.
† Water of oxidation and "preformed" water were ignored.
‡ Insensible water loss was estimated at 500 cc. per square meter per 24 hours.[2a]

TABLE 4.—*Cumulative Chloride Balance Data for the Period Forty-Eight and One-Half to Seventy-Two Hours After Operation**

Cumulative chloride balance, +44 mEq.
From 11:30 a. m., July 20, 1950, to 11 a. m., July 21, 1950; equals 23½ hr.

Intake†			Output				
					Chloride, mEq.		
Volume, Cc.	Fluid	Chloride, mEq.	Volume, Cc.	Fluid	Per Liter	Total	pH
310	Oral	..	215	Urine (11 a. m. to 2:40 p. m.)	105	22	8.0
50	Duodenal replacement fluid‡	7	220	Insensible§	..	4	...
50	10% dextrose in 2% saline	17	80	Urine plus stool (2:40 p. m. to 4:20 p. m.)	128	10	8.0
400	5% dextrose in water	..	340	Urine plus stool (4:20 p. m. to 10:30 a. m.)	50	17	8.0
120	Water irrigation	..	100	Irrigation returned	2	..	7.0
			15	Stool, formed	..	..	...
930	Totals	24	1,000	Totals	..	53	...

* Daily balance: Water −70 cc.; chloride, −29 mEq.; cumulative chloride balance, +15 mEq.
† Water of oxidation and "preformed" water were ignored.
‡ A repair solution containing 119 mEq. of chloride per liter as sodium chloride, 12 mEq. of chloride per liter as potassium chloride, 6 mEq. of chloride per liter as calcium chloride, and 6 mEq. of chloride per liter as magnesium chloride, or a total of 143 mEq. of chloride per liter.
§ Insensible water loss was estimated at 500 cc. per square meter per 24 hours.[2a] Sensible water loss (50 cc. in 24 hours) with appropriate chloride content (70 mEq. per liter) [2b] was estimated from observation and added to the calculated insensible water loss. Chloride content of sweat in infants may be significantly lower than that of adults as suggested by Cooke and others.[2c]

positive water balance (gain in total body water) of 474 cc. (Table 2), and a negative cumulative chloride balance (loss of body chloride) of 13 mEq. (Table 2). While this was indicative of gain in body water and loss of body chloride, any balance of body water which includes an estimate of insensible loss of water may be grossly inaccurate; so, such a balance is not valid evidence. Change of body weight is the simplest dependable evidence for similar change in body water. Unfortunately, serial determinations of body weights were not available. Possibly the

most significant fact indicating excess of water was the intravenous administration of 500 cc. of 5% solution of dextrose in water in the two and one-half hours preceding the beginning of symptoms. This fairly rapid rate of administration was considered important in the appearance of symptoms, though it was less than the "ceiling rate" of 10 cc. per square meter of body surface per minute advocated by Talbot [3] for normal kidneys. Whether ureterosigmoidostomy might have altered renal function is problematic. Furthermore, the concentration of urinary chloride had fallen to the low level of 3 mEq. per liter, indicating extreme renal conservation of chloride.

This evidence together with the clinical findings and lowered level of plasma electrolyte was the basis for a diagnosis of water intoxication.

To correct this suspected sudden dilution of body electrolytes, administration of hypertonic (2%) solution of sodium chloride in 10% solution of dextrose was started intravenously. About 100 cc. were given in 30 minutes, with cessation of convulsions. Then 75 cc. of whole blood were given, after which administration of hypertonic (2%) solution of sodium chloride in 10% solution of dextrose was continued slowly for the rest of the 12 hours. The balance data for this period of active treatment (Table 3) showed a gain of 57 mEq. of body chloride and a loss of 63 cc. of body water. Despite this indicated increase in body tonicity with symptomatic improvement, the concentration of urinary chloride was only 2 mEq. per liter. It was decided to continue administering hypertonic sodium chloride solution very slowly while analyzing the urine (or "urine plus stool") for chloride at frequent intervals. Administration of hypertonic sodium chloride solution was to be discontinued as soon as the concentration of urinary chloride rose above the arbitrarily chosen "minimal normal" of 20 mEq. per liter (Table 4). The next determination of urinary chloride, made three hours and 40 minutes after the routine determination of the balance, yielded a value of 105 mEq. per liter; therefore, the administration of hypertonic sodium chloride solution was discontinued. One hour and 40 minutes later the concentration of urinary chloride had risen to 128 mEq. per liter. The final concentration of urinary chloride in this period (Table 4) was 50 mEq. per liter. After this time her clinical course continued to improve, and she was apparently completely normal 48 hours after the end of the convulsions.

In this case of water intoxication, cumulative-chloride-balance data were believed valuable adjuncts in both diagnosis and therapy.

3. Talbot, N. B.: Endocrine Homeostasis in Clinical Pediatrics, Pediatrics **6**:1-8 (July) 1950.

Abstracts from Current Literature

Vitamins; Avitaminoses

A Case of Pellagra in a Child. A. Flies, Ann. pædiat. **178**:165 (March) 1952.

Report is made of pellagra in a 2-year-old girl. The child had typical pellagra dermatitis and neurovegetative symptoms, with depression and muscular atony as in erythredema polyneuropathy. Sweating and acrocyanosis were absent, but tachycardia and hypertension existed. The treatment consisted in a protein-rich diet and administration of nicotinic acid and resulted in a quick cure. As accompanying signs, severe dystrophy, hypochromic anemia, and a moderately severe osteoporosis were found. In the discussion of cause and pathogenesis, the importance of animal protein in the food is stressed. The syndrome of kwashiorkor is mentioned in the discussion of the differential diagnosis.

From the Author's Summary.

Prematurity and Congenital Deformities

Report of 2 Years' Experience in the Transportation of Premature Infants in New York City. Helen M. Wallace, Margaret A. Losty, and Leona Baumgartner, Pediatrics **9**:439 (April) 1952.

This report presents some facts about premature infants, based on a two-year experience in the transportation of 1,209 small prematurely born infants to special "premature centers" in New York. The data point the way for further developments in a program of care for the premature infant and in the prevention of premature labor. The importance of the parallel development of a sound maternity program and a special program to care for premature infants is emphasized.

From the Authors' Summary.

Newborn

Hemorrhagic Tendency in the Newborn. C. Salazar de Sousa, L. Levy, Y. Crespo Ferreira, and A. Ferreira Gomes, Lattante **23**:1 (Jan.) 1952.

Determinations were made of the heparin content in the blood of 43 infants during the first hours of life and repeated in 22 of the same infants on the fifth day. In the blood of 12 infants, the heparin content was lower on the fifth day, in 5 it was higher, and in 5 it was the same. Determinations were also made on the blood of 25 children from 4 months to 19 years old. In only two instances was the heparemia higher than the average figure for the newborn baby, and in only four was it higher than the average for the 5-day-old baby. The average figures for heparemia for the just-born, the 5-day-old infant, and the older child were 80, 71, and 56, respectively.

The low-fibrinogen and high-heparin contents of the blood explain the greater tendency for newborn babies to bleed. Prothrombinemia is reported to diminish during the first five days of life, the effect of which is counterbalanced by the diminished heparemia. Higgins, Boston.

Identification of Newborn Infants by Footprints. J. Gomez Fernandez, Acta pediat. espan. **10**:31 (Jan.) 1952.

The right footprint of a newborn baby and a print of the right index finger of the mother should be imprinted on each birth certificate. The author believes this is the best form of identification. Many illustrations are included in this article, as well as reports of actual cases and hypothetical cases in which such identification was or could be very useful.

Allen, San Francisco.

Acute Contagious Diseases

HERPETIC ANGINA AND MEASLES. E. SCHIFF, Ann. pædiat. **178**:161 (March) 1952.

In two children who were in the prodromal stage of measles the only symptom observed was herpetic tonsillitis; all other symptoms belonging to the prodromal stage were absent. More recent research findings concerning the cause of herpetic tonsillitis are mentioned, and the possibility of a common causative organism is discussed. FROM THE AUTHOR'S SUMMARY.

Acute Infectious Diseases

CONGENITAL INFECTION WITH COXSACKIE VIRUS. E. FREUDENBERG, F. ROULET, and R. NICOLE, Ann. pædiat. **178**:150 (March) 1952.

A congenital fracture of the proximal femur epiphysis was discovered in a newborn baby; there were also signs of dislocation of a hip. The callus formation proves that the fracture occurred before birth. Extension of the dislocation was impossible because of a flexural contracture which necessitated a tenotomy after six months. During the operation a severe myositis was discovered, the nature of which was recognized to be anatomically related to the damage caused by the Coxsackie virus.

The virus was found in an excised piece of muscle, and it was discovered that the virus was highly virulent to mice. The infant's serum did not contain any neutralizing antibodies, while the mother's serum possessed, at best, only a minimal neutralizing power (tested at seven months post partum, probably too late). In contrast to the acute myalgias known from human epidemics and human laboratory infections, there thus exist cases of chronic myositis caused by Coxsackie-virus infection. The organism was found in human tissue for the first time in this case, and the histologic muscle changes could be demonstrated in man for the first time.

FROM THE AUTHORS' SUMMARY.

Chronic Infectious Diseases

USE OF BCG VACCINE IN A NEW DIAGNOSTIC TEST FOR TUBERCULOSIS. ELI FRIEDMAN and IRVING SILVERMAN, Pediatrics **9**:280 (March) 1952.

The authors call attention to the well-known fact that a tuberculin test, as done routinely with old tuberculin, often fails to elicit a positive reaction in the presence of known infection with tuberculosis. At other times the same tuberculin test will elicit a pseudopositive reaction in persons who never were infected with tuberculosis. In other words, the tuberculin test as done with old tuberculin often lacks sensitivity, and at other times it lacks specificity.

The BCG diagnostic test is recommended as being a more sensitive and specific test for tuberculosis. The authors recommend its use as a supplementary test in all cases in which the results obtained with tuberculin are questionable and do not fit in with the clinical picture. The test is performed by making a skin puncture through a drop of BCG vaccine and is based on Koch's phenomenon.

FROM THE AUTHORS' SUMMARY.

SENSITIVITY TO TUBERCULIN AS AFFECTED BY THE MAINTENANCE OF THE VACCINAL FOCUS IN GUINEA PIGS VACCINATED AGAINST TUBERCULOSIS. FIORELLA KIRCHEIS, Clin. pediat. **33**:807 (Dec.) 1951.

Observations with guinea pigs showed that after the site of the vaccination against tuberculosis had been excised, the tuberculin reaction soon became negative.

HIGGINS, Boston.

CLINICAL AND SOCIAL PROBLEMS WHICH ARE BASIC IN THE TREATMENT OF TUBERCULOUS MENINGITIS. JORGE COMIN, Acta pediat. españ. **10**:19 (Jan.) 1952.

The author discusses the economic and social implications in the treatment of tuberculous meningitis. The necessity of an early diagnosis if there is to be a cure, the necessity of adequate diagnostic aids, and the scarcity of drugs and hospital facilities, with the attendant expenses, make this disease a problem which should be handled with careful consideration of all the factors.

ALLEN, San Francisco.

Diseases of Blood, Heart and Blood Vessels, and Spleen

CHRONIC HEMOLYTIC ANEMIA IN A WHITE CHILD DUE TO THALASSEMIA AND SICKLEMIA, WITH A GENEALOGIC SURVEY. CHARLES F. WASSERMAN, V. RAE PHELPS, and A. J. HERTZOG, Pediatrics **9**:286 (March) 1952.

The authors have described the second case in the United States of chronic hemolytic anemia resulting from the genetic factors for sicklemia and Cooley's anemia (thalassemia) minor, in combination. A complete hematologic study of 37 relatives of the propositus is presented. The four possible theories, as proposed by earlier investigators, which may expain the severe clinical manifestations are given.

FROM THE AUTHORS' SUMMARY.

EXOGENOUS HEMOCHROMATOSIS IN MEDITERRANEAN ANEMIA. ABRAHAM M. FRUMIN, SYDNEY WALDMAN, and PAUL MORRIS, Pediatrics **9**:290 (March) 1952.

A moderately severe form of Cooley's (Mediterranean) anemia in a patient who received many transfusions over a period of years is presented. The failure of splenectomy to modify the course of this disease is confirmed. Increasing pigmentation of the skin and progressive hepatomegaly were noted with the passing of years. The diagnosis of exogenous hemochromatosis was made. The presence of essentially normal liver function in the presence of microscopic features of severe liver disease was noted. The pathologic features of pigment deposition in Cooley's anemia were reviewed. These were ascribed to an inherited defect which was also responsible for the hematologic and osseous lesions of the disease. The findings of pigment deposition in Cooley's anemia were compared with those found in persons with exogenous hemochromatosis. They were found to be identical. From this the authors conclude that the abnormalities of pigment deposition in Cooley's anemia, previously ascribed to an inherited defect, are due to the multiple blood transfusions that these patients have received.

FROM THE AUTHORS' SUMMARY.

LIPID GRANULOMATOSIS WITH ACRODYNIA. T. D. STAHLIE and C. A. WINKEL, Maandschr. kindergeneesk. **18**:402 (No. 11) 1950.

Description is given of the simultaneous onset of symptoms of lipid granulomatosis and acrodynia in a 4-year-old boy. He recovered spontaneously. The pathogenesis is discussed, and the suggestion is made that in this case the granulomatous process which forms the essential feature of Schüller-Christian disease had caused a state of overstimulation, or cessation of inhibition, of the posterior hypothalamic nucleus, which might explain the symptoms of acrodynia.

FROM THE AUTHORS' SUMMARY.

THROMBASTHENIA. A. ANDRE, Maandschr. kindergeneesk. **19**:95 (May) 1951.

A clinical and hematological description is given of two patients. One suffered from thrombasthenia, Glanzmann type; the other had a nonhereditary syndrome belonging to the group of thrombopathies. By a new method of staining it was impossible to determine the diameter of the thrombocytes. A significant difference was thus demonstrated between the diameter of the thrombocytes in thrombasthenia and normal thrombocytes.

FROM THE AUTHOR'S SUMMARY.

PURULENT PERICARDITIS CONSERVATIVELY TREATED WITH PENICILLIN. A. DEKKER-JONKER, H. A. P. HARTOG, and H. G. HUIBREGTSE-MEYERINK, Maandschr. kindergeneesk. **19**:112 (June) 1951.

A boy, 2 years old, with an acute purulent pericarditis due to Staphylococcus aureus, probably following an impetigo, was treated by repeated aspiration of the purulent exudate, with administration of penicillin into the cavity of the pericardium and intramuscularly. The child recovered completely. A year later he was in excellent condition, and no signs of constrictive pericarditis were present.

FROM THE AUTHORS' SUMMARY.

CLINICAL SYMPTOMS OF DOUBLE AORTIC ARCH. J. EXALTO, W. K. DICKE and W. C. AALSMEER, Nederl. tijdschr. geneesk. **94**:2798 (Sept. 30) 1950.

A description is given of three infants operated upon for double aortic arch, respectively 4, 6, and 10 months old. In all three, the characteristic stridor and roentgenograms with barium-filled esophagus led to the correct diagnosis. The children recovered.

VAN CREVELD, Amsterdam, Netherlands.

Diseases of Nose, Throat, and Ear

INTRAVENOUS PROCAINE FOLLOWING TONSILLECTOMY. SOMERS, K., Ann. Otol. Rhin. & Laryng. **60**:175 (March) 1951.

Inasmuch as good results have been reported when a dilute solution of procaine hydrochloride is given intravenously for the treatment of a variety of traumatic and painful conditions, the author utilized this preparation in an attempt to relieve post-tonsillectomy pain. A discussion of the mode of action and probable safe therapeutic intravenous dosage of procaine hydrochloride is presented.

Forty-one patients were given intravenous procaine injections the day after tonsillectomy. The first group of 18 patients received 10 cc. of a 1% solution, the second group of 20 patients received 10 cc. of a 2% solution, and a third group of 3 patients were given 20 cc. of a 2% solution. All injections were administered within a five-minute period. In the first group, analgesia of the tonsil fossae lasted for an average of two hours, while patients in the second group experienced analgesia for about four hours, and those in the third group nine and one-half hours. A fairly high blood level of procaine hydrochloride was demonstrated in five of the patients 15 minutes after the intravenous injection.

Unpleasant symptoms experienced by patients during injection precluded the use of the drug in routine post-tonsillectomy care.

STEELE, Kansas City, Kan. [A. M. A. Arch. Otolaryng.].

THE EFFECT OF MATURATION UPON DEFECTIVE ARTICULATION IN GRADES 7 THROUGH 12. HELEN K. SAYLER, J. Speech & Hearing Disorders **14**:202 (No. 3) 1949.

Tests for speech disorders were done for 1,998 pupils in grades 7 through 12 in six cities and towns in Idaho. None of the children had had speech correction or specific speech training in schools. A typewritten list of 56 sentences of third-grade level or less was read by each child tested in a room before other pupils. Improvement in sound errors as a result of maturation was found to be less in the intermediate than in the primary grades. There was a slight decrease in the mean number of articulatory errors. There was no significant difference in the average number of errors made by boys and by girls with articulatory defects, although there were slightly more boys than girls who made errors in all grades except grade 12. Results indicate a need for corrective work in secondary schools. The method of study did not indicate errors of propositional speech.

PALMER, Wichita, Kan.

OTOLARYNGOLOGICAL EXPERIENCES IN A HEARING SURVEY. ARNOLD GROSSMAN and RICHARD E. MARCUS, J. Speech & Hearing Disorders **14**:240 (No. 3) 1949.

In Will County, Ill., a hearing program was started on Nov. 3, 1947, and all school children aged 6 through 19 years were tested during the following seven months. There were 20,663 children, and during the first visit 4.7% were absent. Of the 971 originally absent, 581 were recorded later, leaving an absentee record of 1.8%. In all, 1,646 children, or 7.9%, required otological investigation on the basis of a 30-decibel loss in either ear and at any frequency between 128 and 8,192 cps. Boys far outnumbered girls. Only 0.4% of the referred children were found to be normal upon clinical examination. In the presence of parents, 1,471 children were examined by a program otologist. In 12% of the cases a clinical syndrome of allergic rhinosalpingitis seemed suggestive as a cause of hearing loss. Continuous follow-up study was

maintained from the moment of screening, through the otological clinic and through referral to family physicians or otolaryngologists of choice. Diagnosis, recommendations, and treatments were recorded. Educative and rehabilitative follow-up studies were maintained.

PALMER, Wichita, Kan.

EDUCATION OF HARD OF HEARING CHILDREN. AUGUSTA JELLINEK, Nerv. Child **9**:77 (Jan.) 1951.

This is one of several articles appearing in this journal in a symposium of "Problems of Speech Comprehension." Most of the papers in this number are informative and worth reading.

The child with a severe hearing disorder may not be able to develop speech spontaneously. The importance of early determination of hearing is stressed. If there is any doubt after the first year, auditory training should be instituted. The earlier in life one can supply lacking acoustic sensations through amplification by increasing hearing, the better the chance for speech development.

The use of hearing aids, even in as young an infant as 18 months, is desirable, primarily so that he may hear his own voice and thus stimulate his development through comparison with others. The author recommends the teaching of lip reading and use of hearing aids before the age of 3 and estimates that 40 to 50% of deaf children may then be able to attend normal schools.

Children with hearing loss of slighter degree are often erroneously classified as retarded. Articulation of these children suffers unless their perception of sound is improved through various devices. After initial training, a conscious effort must be made not to rely too much on lip reading. In other words, the visual aspects of speech should be minimized, and the child should be treated as if his hearing were normal.

Besides training in hearing speech, the child must learn the source of sounds and hence the warning values in terms of his own safety. Most children enjoy and are proud of their hearing aids, but children very often have to be gradually accustomed to their use.

WEINFELD, Highland Park, Ill.

EXCISION OF EXTENSIVE LYE STRICTURES OF ESOPHAGUS. J. R. PAINE, New York J. Med. **51**:2628 (Nov. 15) 1951.

Paine remarks that dilatation of strictures may seem to be interminable and unsatisfactory, but not until quite recently did surgery offer good results. He reports upon two patients, aged 5 and 9, in whom he excised the strictures and joined the stomach to the proximal end of the esophagus. The first operation required five and one-half hours and 750 cc. of blood and called for freeing of both stomach and esophagus, resection of the stricture, drawing up of the stomach into the right chest to the level of the aortic arch, and anastomosis with the anterior wall of the stomach. After 16 months "she can eat all types of food." In the second case, with a similar technique, anastomosis was done at the level of the second thoracic vertebra. Paine emphasizes the cost of treatments previous to surgery. In the first case it was $3,815.90, and in the second $5,714.99. Since few families can bear such a burden, taxpayers must meet the bill. By contrast, surgery at the proper time cuts this expense greatly. Complications which are regarded as unimportant are regurgitation of food for a short time only and competition of lung and stomach for spatial movements. "The American literature contains reports of 16 other excisions of extensive inflammatory strictures, with only one death and satisfactory results in the surviving 15 patients."

It should be mentioned that Chevalier Jackson many years ago publicized strictures from lye swallowing and succeeded after almost interminable efforts in securing legislation demanding "poison" labels on all packages of lye, with antidotes to be used immediately. He also advised that all such articles be kept out of the reach of children.

VOORHEES, New York [A. M. A. Arch. Otolaryng.].

SINOBRONCHITIS IN CHILDREN. SAMUEL GEORGE SCHENCK and MORTON SELDOWITZ, Radiology **67**:240 (Feb.) 1952.

The authors define sinobronchitis as a subacute or chronic infectious process involving the mucosa of the paranasal sinuses with secondary implantation of the infection upon the mucous membrane of the bronchi through postnasal drainage with subsequent production of hilar infiltration and focal pulmonary lymphadenopathy. One hundred sixty-eight patients with this entity were treated with x-rays, with full recovery in 58% of cases, marked improvement in 28%, moderate improvement in 11%, and slight improvement in 3%. Case reports with roentgenograms of the sinuses and the chest are presented, and details of the x-ray therapy are given. Treatments are given to the sinuses and chest over a four-week period. The authors believe that sinobronchitis is a distinct clinical entity and that x-ray therapy is the most effective treatment.

HODGSON, Rochester, Minn.

Diseases of Lungs, Pleura, and Mediastinum

DIFFERENTIATION OF CONGENITAL CYSTS OF THE LUNG AND THOSE FOLLOWING STAPHYLOCOCCIC PNEUMONIA. WILLIS J. POTTS and WILLIAM L. RIKER, Arch. Surg. **61**:684 (Oct.) 1950.

The primary causes of radiolucent areas in the lungs in infants are congenital lung cysts and acquired lung cysts or pneumatoceles. Staphylococcic pneumonia is the commonest cause of radiolucent areas in the lungs during infancy. When a cyst-like cavity is found in the lungs upon roentgenologic examination, it must be determined as certainly as possible whether it is a congenital cyst or a pneumatocele formed after a respiratory infection. Treatment of the former is by surgical excision; treatment of the latter is usually conservative.

Differentiation may be aided by consideration of the following points: 1. It should be determined from the history whether the child has had proved staphylococcic pneumonia or a history of severe respiratory illness. 2. If a cystic cavity is found before any respiratory illness has occurred a diagnosis of congenital cyst is almost certain. 3. Congenital cysts usually maintain a rather constant size, while pneumatoceles may fluctuate in size rapidly. 4. Congenital cysts may show thicker walls roentgenographically than acquired cysts. 5. Infection in the congenital cyst occurs more frequently as the child grows older, but is rare in the pneumatocele.

KAISER, Rochester, N. Y.

INTERSTITIAL MEDIASTINAL EMPHYSEMA DUE TO BRONCHIAL ASTHMA: CASE REPORT. I. S. KAHN and J. W. H. ROUSE, J. Allergy **22**:111 (March) 1951.

A report is made of interstitial mediastinal emphysema due to a mild case of bronchial asthma occurring in a 5-year-old boy. The report is of interest because of the authors' explanation of the way air may have traveled from the alveolar sacs to the mediastinum. The air, he believes, traveled from the ruptured sac along the perivascular sheathes and followed the course of the blood vessels to the hilus of the lung; from there it moved to the post and middle mediastinum, then forward between the parietal pleura to the pericardium, and then to the anterior mediastinum, neck, and thorax.

HOYER, Cincinnati.

EMPYEMA IN INFANTS AND CHILDREN. CLAUDE A. FRAZIER and EDGAR DAVIS, J. A. M. A. **146**:247 (May 19) 1951.

The treatment of 37 infants and children with empyema admitted to the Children's Hospital in Washington, D. C., from Jan. 1, 1943, to April 1, 1948, is described. Drainage by surgery is recommended. Hemolytic Staphylococcus aureus was the infecting organism in the infants, causing the usual mortality rate of 50% in infants under one year old. Of the 37 cases of empyema only 2 developed after 1945 when the pneumonia was treated with penicillin seemingly late or inadequately.

KIMBALL, Evanston, Ill.

EVALUATION OF THE TREATMENT OF PRIMARY ATYPICAL PNEUMONIA WITH AUREOMYCIN, CHLOROMYCETIN, AND TERRAMYCIN. FAY B. GRAVES and WALTER O. BALL, J. Pediat. **39**:155 (Aug.) 1951.

Good results were obtained in 90%, or more, of infants with atypical pneumonia. Aureomycin, chloramphenicol (chloromycetin®), and terramycin were about equally effective. The value of aureomycin was lessened by a higher incidence of gastrointestinal side-effects. Side-effects of chloramphenicol were only slightly more frequent than those of terramycin. The authors feel that terramycin is the drug of choice.

MACDONALD, Pittsburgh.

TREATMENT OF STAPHYLOCOCCIC PNEUMONIA WITH CHLOROMYCETIN IN INFANCY. J. ZELENKA, M. KUCEROVA, and V. MYDLIL, Pediat. listy **6**:42 (No. 1) 1951.

The rapid therapeutic effect of chloramphenicol (chloromycetin®) is described in three patients with severe penicillin-resistant staphylococcal pneumonia after previous unsuccessful treatment with streptomycin, penicillin, the sulfonamides, and other auxiliary remedies. The rapidity of the effect, followed by a long-lasting sterility of the air passages, is pointed out. This makes chloramphenicol extremely suitable for the treatment of severe bronchopneumonia in infants and for preventive treatment before and after abdominal, chest, and other operations. The necessity of examining Staphylococcus aureus for penicillin sensitivity is stressed. It is shown that only small dosages of chloramphenicol are required for treatment of severe pulmonary diseases in infants.

FROM THE AUTHORS' SUMMARY.

CHYLOTHORAX IN CHILDREN: CONTRIBUTION TO THE KNOWLEDGE OF THE PATHOGENESIS. WILHELM BLYSTAD and HJALMAR WERGELAND, Acta pædiat. **37**:453 (No. 5-6) 1949.

An account is given of a case of recurrent chylothorax in a girl just over 2 years old, with no known trauma or other demonstrable cause. A marked disproportion was demonstrated between the content of fat in the chyle and the diet administered to the child. The authors are of the opinion that this may indicate that the exudate was not due to a rupture of the thoracic duct but had been produced by a process of filtration. The investigations made are believed to support the concept that no clear distinction exists between the chylous and the "pseudochylous" exudate.

By correlating the fat content of the exudate with the amount of fat administered, a clue may be obtained as to whether a rupture of the thoracic duct is present or not, which may be significant in determining treatment.

FROM THE AUTHORS' SUMMARY.

PRIMARY PULMONARY VASCULAR SCLEROSIS IN INFANCY. C. G. HERDENSTAM, Acta pædiat. **38**:284, 1949.

The literature on primary pulmonary vascular sclerosis is reviewed, and a case of this disease in a boy of 7 months is described. This appears to be the first case reported in infancy. The symptomatology was characterized by failure to gain weight, caused by feeding difficulty, and by attacks, resembling angina pectoris, which were earlier considered pathognomonic of an anomaly of the coronary arteries in conjunction with an enlargement of the left ventricle. Roentgenologic examination revealed clear, poorly vascularized pulmonary fields and a gross enlargement of the heart. This was first considered to be caused by the left ventricle but was later found, when the interventricular groove was demonstrated, to be due to a marked enlargement of the right heart. The electrocardiogram revealed signs of severe myocardial damage, mainly of the type of an infarction, and pronounced right-sided cardiac hypertrophy. The diagnosis was made on the basis of the microscopic examination of the heart and lungs.

FROM THE AUTHOR'S SUMMARY.

TREATMENT OF PNEUMONIA IN CHILDREN BY A SINGLE DOSE OF SULFATHIAZOLE. CARL FRIDERICHSEN and THEODOR WALTHER, Ugesk. læger **111**:1467 (Dec. 29) 1949.

A single peroral dose of sulfathiazole, 0.30 gm. per kilogram of body weight (total dose not over 4 to 5 gm.), was used in the treatment of 785 patients with bronchopneumonia and 90 patients with croupous pneumonia, all children ranging in age from newborn to 11 years.

In the more severe cases the dose had to be repeated after 24 to 48 hours. The temperature usually began to fall after 12 to 24 hours. The total lethality rate was 4.9%. If children with congenital defects are excluded, the lethality rate was 2.46%, and, if those who were moribund at the time of admission are not considered, the reduced lethality rate was only 0.46%. There were no harmful effects, and it is emphasized that this treatment is easier to administer and less expensive than other methods.

WALLGREN, Stockholm, Sweden.

PNEUMONIA TREATMENT IN CHILDREN. HOLGER BUCH, Ugesk. læger **111**:1476 (Dec. 29) 1949.

Two hundred eleven children were treated with one single dose of sulfathiazole, 69 with two single doses, and 274 with combined sulfathiazole and penicillin. The total lethality rate in the whole series of children was 6.1%, and in children under one year of age, 13%.

WALLGREN, Stockholm, Sweden.

INTRATHORACIC CYSTS OF THE STOMACH. G. M. H. VEENEKLAAS, W. VAN ZEBEN, H. REERINK, and W. H. H. TEGELAERS, Maandschr. kindergeneesk. **19**:37 (April) 1951.

A description is given of four cases of intrathoracic cysts of the stomach wall. Three patients, of whom two died, had hemoptysis. Two patients were operated upon early and are now in good condition.

Three of the four patients showed very similar vertebral anomalies. The vertebral column was examined by body section roentgenography (planigraphy) in the two surviving patients. By this method, more lacunae were found in the vertebral bodies and arches than could be shown by ordinary roentgenologic examination. The anomalies were mainly in the lower cervical and upper thoracic regions. This corresponds with the findings reported in the literature. The very frequent association of intrathoracic cysts of the stomach wall with certain anomalies of the cervical and thoracic vertebrae leads to the assumption of a connection between them.

It is supposed that an adhesion of the notochord to the foregut persists. The descent of the stomach would lead both to anomalies in the vertebral bodies in this part of the vertebral column and to separation of the gastric vertebral attachment (the cyst) from the stomach.

FROM THE AUTHORS' SUMMARY.

DENTOBRONCHITIS. G. M. H. VEENEKLAAS, Maandschr. kindergeneesk. **19**:137 (June) 1951.

Two cases of chronic bronchitis are described. There was also a considerable degree of dental caries but no other pathological findings which might have caused bronchitis. The treatment of the caries, carried out for two years or more previously, was followed by disappearance of the bronchitis. In three other patients treatment of the caries had been carried out for only one year previously, but the results were similar. Because of the short follow-up period they are not described. In the absence of other oral pathology, aspiration of material from the carious elements is considered to be the cause of the bronchitis.

FROM THE AUTHOR'S SUMMARY.

Diseases of Gastrointestinal Tract, Liver, and Peritoneum

THE USE OF POTASSIUM CHLORIDE IN THE PREOPERATIVE TREATMENT OF PYLORIC STENOSIS IN INFANTS. R. M. MATEER, L. GREENMAN, A. C. AUSTIN, J. H. PETERS, H. MERMELSTEIN, F. WEIGAND, and T. S. DANOWSKI, Am. J. M. Sc. **221**:21 (Jan.) 1951.

Measurement of external and internal exchanges, following injection of potassium and sodium chloride solutions together with dextrose to six infants convalescing from vomiting due to pyloric stenosis, revealed a retention of administered potassium, chiefly in the cells, and of sodium and chloride in the extracellular fluid. The therapeutic implications of these changes, such as the substances, the concentrations which should be given, and premixed versus individualized solutions, have been discussed briefly.

HENSKE, Omaha.

ACUTE ESOPHAGITIS IN INFANTS. PETER GRUENWALD and MEMOIR R. MARSH, Arch. Path. **49**:1 (Jan.) 1950.

Acute esophagitis, usually with ulceration, was found in one of every six infants in a series of 310 autopsies. It is believed that the significance of this lesion for the patient's course ranges from an unimportant incidental finding to the principal cause of death. The various possible causes of esophagitis are considered, and no single factor is found which might explain all cases. It is suggested that in many cases it is a "shock" lesion. In the neonatal group of patients, shock may have been the result of various types of birth trauma, including asphyxia. Micro-organisms were demonstrated in tissue sections in half the cases, but because they were of different types they were considered to be secondary invaders. Esophagitis can thus conceivably be a focus from which infection may spread. Vomiting and hemorrhage occurred frequently in patients with esophagitis; perforation into the right pleural cavity was encountered twice.

An effort should be made to diagnose esophagitis in living patients, not only because the lesion, if severe, should be treated but also because it may be an indication of shock, which is difficult to recognize in infants. The validity of the present suggestions will be ascertained, and the significance of esophagitis properly evaluated, only when more clinical observations are available.

CHAN, San Francisco.

HYPERTROPHIC ILEAC STENOSIS SIMULATING REGIONAL ENTERITIS: REPORT OF A CASE WITH NECROPSY. PEARL M. ZEEK and LOUIS G. HERRMANN, Arch. Path. **49**:150 (Feb.) 1950.

The case is presented of a 20-year-old man in whom marked thickening of the terminal part of the ileum was found at autopsy. Microscopically the lesion was found to consist in intense hypertrophy and hyperplasia of smooth muscle. Symptoms beginning at the age of 14 years had led to a diagnosis of regional ileitis. Of note was the occurrence of congenital pyloric stenosis in two siblings and congenital hypertrophic dilatation of the colon (Hirschsprung's disease) in a third. The authors diagnose the condition as hypertrophic ileac stenosis, probably basically congenital in origin, but possibly intensified in puberty by other unknown factors affecting the autonomic nervous system.

CHAN, San Francisco.

CONGENITAL STRICTURE OF THE PORTAL VEIN. EARLE B. MAHONY and LEWIS HOGG JR., Arch. Surg. **61**:713 (Oct.) 1950.

The authors report a detailed study of two patients with Banti's syndrome due to stricture of the portal vein. Both patients experienced massive hemorrhage from gastric and esophageal varices by the age of 4 years. Splenomegaly was present in each patient, and the liver function was normal, with no ascites. The pathologic finding common to both patients was a fibrotic stricture of the portal vein just at the point where the vein entered the liver parenchyma. It is pointed out that this pathological condition must be considered in the differential diagnosis of massive gastrointestinal hemorrhage occurring in very young persons. The most promising method of treatment appears to be a direct anastomosis between the portal vein and the vena cava, since there is complete occlusion of the portal vein.

KAISER, Rochester, N. Y.

RECENT EXPERIENCES WITH INTESTINAL RESECTION IN INFANTS AND CHILDREN. CLIFFORD D. BENSON and HARVEY R. SHARPE JR., Arch. Surg. **61**:822 (Nov.) 1950.

Intestinal resection in newborn infants, infants, or children is indicated in irreducible intussusception, in Meckel's diverticulum requiring intestinal resection, and in some rare congenital lesions. Until recently this operative procedure has been associated with a high mortality. With proper preoperative and postoperative care, accurate diagnosis at the time of laparotomy, good anesthesia, meticulous handling of the involved segments of bowel, and accurate anastomosis, the authors obtained good results in 10 infants and children requiring intestinal resection and immediate anastomosis for survival or cure. One death occurred in this group.

KAISER, Rochester, N. Y.

MECONIUM PERITONITIS. GEORGE B. PACKARD and LEVI E. REYNOLDS, Ann. Surg. **133**:548 (April) 1951.

Meconium peritonitis is defined as a sterile chemical or foreign-body peritonitis due to escape of meconium from the intestinal tract into the general peritoneal cavity. In all, over 100 cases have been reported up to June 1949. The condition is the result of intestinal perforation occurring during uterine life, at birth, or very shortly after birth.

Meconium peritonitis occurring during fetal life is usually associated with intestinal obstruction and is not necessarily fatal. Meconium peritonitis occurring at or immediately after birth may be the result of intestinal obstruction or trauma or both. The characteristic signs of postpartum meconium peritonitis are very early vomiting and distention which is progressive. Diagnosis is helped greatly by roentgenologic demonstration of dilated intestinal loops and free air in the abdominal cavity. Prognosis is poor, but early recognition and operation before bacterial contamination have saved some of these patients.

Two cases are presented.

BANTIN, Omaha.

THE PROTHROMBIN RESPONSE TO THE PARENTERAL ADMINISTRATION OF LARGE DOSES OF VITAMIN K IN SUBJECTS WITH NORMAL LIVER FUNCTIONS AND IN CASES OF LIVER DISEASE: A STANDARDIZED TEST FOR THE ESTIMATION OF HEPATIC FUNCTON. PAUL N. UNGER, SHEPARD SHAPIRO, and SHIRLEY SCHWALB, J. Clin. Invest. **27**:39 (Jan.) 1948.

The capacity for prothrombin production after parenteral administration of large doses of vitamin K was used as a test of liver function. Vitamin K was given in doses of 16 mg. intravenously for four successive days. Fifty-six patients with frank liver disease and 57 control subjects were studied. Results of prothrombin production were correlated with other tests of hepatic function. Biopsies of specimens of the liver were done in a few patients.

Negative results, after vitamin K administration, were defined as (1) no change in prothrombin level, (2) a return from hypoprothrombinemic to normal levels, or (3) a rise from normal to hyperprothrombinemic. Positive results were defined as (1) failure to increase an already lowered prothrombin content, (2) further depression in prothrombin content, or (3) a transient depression of a lowered prothrombin content. The diluted (12.5%) plasma method of estimation of prothrombin time was used.

Data showed the vitamin-K-tolerance test to be a sensitive indicator of liver function, and it correlated well with other clinical findings indicative of liver damage.

BRODSKY, Louisville, Ky.

BLEEDING DUODENAL ULCER IN INFANCY, A SURGICAL PROBLEM: REPORT OF 2 CASES TREATED SUCCESSFULLY BY SURGERY. GEORGE W. PLUMMER and SAMUEL J. STABINS, J. Pediat. **37**:899 (Dec.) 1950.

The physician confronted with an infant with gastrointestinal hemorrhage must consider duodenal ulcer in the differential diagnosis. Hematemesis may be absent. Severe or prolonged hemorrhage should be treated by immediate exploratory laparotomy. The authors report on two infants under one year old, both of whom recovered.

MACDONALD, Pittsburgh.

EPIDEMIC DIARRHEA OF INFANCY. A. DANIEL RUBENSTEIN and SIDNEY A. BRITTEN, J. Pediat. **38**:457 (April) 1951.

The authors studied an epidemic of diarrhea in infants in Boston. They discovered that at the time of the epidemic observed in various hospital nurseries there was a high incidence of diarrhea and vomiting among older children and adults in the community. The cause was not found. Control of such epidemics, however, must be based upon measures applicable to other diseases disseminated by personal contact.

MACDONALD, Pittsburgh.

ANOMALOUS ANAL PAPILLAE IN INFANTS AND CHILDREN. SAMUEL J. NICHAMIN and HERBERT I. KALLET, J. Pediat. **38**:468 (April) 1951.

Ulceration of the base of abnormal anal papillae will produce pain and bleeding upon defecation in infants. Surgical removal of the anomalous papillae gives prompt and dramatic relief.

MACDONALD, Pittsburgh.

CONGENITAL TRACHEO-ESOPHAGEAL FISTULA WITHOUT ESOPHAGEAL ATRESIA. JAMES A. HELMSWORTH and CHARLES V. PRYLES, J. Pediat. **38**:610 (April) 1951.

A 6-month-old infant had been hospitalized four times because of recurrent pneumonitis and because of coughing and cyanosis during feedings. Roentgenograms of the esophagus (with the patient in the supine and lateral decubitis position) and endoscopy of the esophagus and the trachea failed to reveal a suspected fistula. Nevertheless, a diagnosis of tracheoesophageal fistula without atresia was made. The indicative signs were recurrent pneumonitis, coughing related to feeding, and meteorism. A rapid increase in abdominal distention after feeding and coughing is a helpful corroborative sign. Upon operation, the diagnosis was confirmed and the fistula closed. The boy recovered.

MACDONALD, Pittsburgh.

CONGENITAL ATRESIA OF THE ESOPHAGUS TREATED BY A ONE-STAGE PRIMARY ESOPHAGO-GASTROSTOMY EMPLOYING A RIGHT TRANSPLEURAL APPROACH. JOHN L. MADDEN, J. Thoracic Surg. **21**:460 (May) 1951.

Congenital atresia of the esophagus is usually associated with tracheoesophageal fistula (90% of cases). In the remaining 10% of cases, those without tracheoesophageal fistula, the distal esophageal segment is either hypoplastic or entirely absent, precluding the feasibility of an end-to-end reconstruction of the esophagus. Determination of the presence or absence of an associated tracheoesophageal fistula is important. The presence of air in the stomach and small intestine indicates the probable existence of a tracheoesophageal fistula. Bigger has advised the use of iodized oil intratrachially as a confirmatory test.

MEYER, Chicago.

CONGENITAL ATRESIA OF THE DUODENUM. W. H. KISNER and J. D. COFFEY, New Orleans M. & S. J. **103**:515 (June) 1951.

The problem of congenital atresia of the duodenum is discussed thoroughly. Two cases are reported with details of preoperative and postoperative care.

MCGUIGAN, Evanston, Ill.

RETROPERITONEAL TERATOMAS IN INFANCY AND CHILDHOOD. ERNEST E. ARNHEIM, Pediatrics **8**:309 (Sept.) 1951.

The histogenesis, pathologic and clinical features, diagnosis, and treatment of retroperitoneal teratomas in infancy and childhood, based upon a study of 44 cases, are reviewed. Two cases of benign retroperitoneal teratomas with recovery and one case of cancerous retroperitoneal teratoma with subsequent death are presented. Retroperitoneal teratomas were usually noted in girl infants under the age of one year as large, left-sided, abdominal tumors extending into the lumbar region, rarely causing symptoms, and revealing areas of ossification upon roentgenologic examination. In this series, 6.8% of the teratomas had undergone cancerous changes, and 29.5% of the tumors were not operated upon and were described at autopsy.

Successful treatment of retroperitoneal teratomas was depedent upon early operation, careful operative technic through a liberal transperitoneal incision, and adequate preoperative and post-operative management. The operative mortality was 29%. Histologic features constituted an important factor in prognosis. Ten patients with benign retroperitoneal teratoma in infancy and childhood were well for periods of over one year after operation, and no cure of cancerous retroperitoneal teratoma has been reported in this age group.

FROM THE AUTHOR'S SUMMARY.

DIAGNOSIS AND TREATMENT OF MECONIUM PERITONITIS. CHARLES R. DOYLE, South. M. J. **44**:358 (April) 1951.

Report is made of two patients successfully treated by operation. Meconium peritonitis is due to rupture of the bowel proximal to an area of stenosis or atresia. The condition is to be suspected if vomiting begins immediately after birth, if there is distention of the abdomen, if there is no normal meconium stool, and if there is roentgenologic evidence of dilated loops of bowel and possibly calcification densities in the peritoneal cavity.

LOGAN, Rochester, Minn.

FIBROCYSTIC DISEASE OF THE PANCREAS. V. ABBOTT, J. F. MCCREARY, R. POCOCK, and A. BROWN, Canad. M. A. J. **64**:419 (May) 1951.

Three cases of fibrocystic disease are presented, with a brief review of current theories as to causation and treatment.

MCGUIGAN, Evanston, Ill.

THE CELIAC SYNDROME. J. F. MCCREARY, V. ABBOTT, R. POCOCK, and A. BROWN, Canad. M. A. J. **64**:424 (May) 1951.

A brief summary is given of the celiac syndrome, with special reference to the general clinical picture and treatment.

MCGUIGAN, Evanston, Ill.

SPECIFIC SEROLOGICAL TYPE OF BACTERIUM COLI FOUND IN INFANTS' HOME IN ABSENCE OF EPIDEMIC DIARRHOEA. A. M. M. PAYNE and G. T. COOK, Brit. M. J. **2**:192 (July 22) 1950.

In the past several years a good deal of attention has been given to a particular serologic type of Escherichia (Bacterium) coli which has been found associated with outbreaks of infantile diarrhea and vomiting in certain hospital wards. These studies have been reported by Bray in 1945, Bray and Beavan in 1948, Giles and Sangster in 1948, and Taylor in 1949. While the name of this specific serologic type of E. coli has varied, it appears from a serologic standpoint that all of the organisms are the same. The authors go into detail as to their method of identifying the organism, and their criteria would seem to be sound.

Because of the interest in this organism, and because of an outbreak of diarrhea in several babies in an isolated nursing home for infants, the authors became interested in getting routine rectal cultures from all the babies over a period of one year. During this period, 337 rectal swabs from the babies were examined, cultured, and typed carefully. The number of swabs done on individual patients varied from 1 per infant to as many as 12 or more per infant. The cultures were taken at various intervals, sometimes as frequently as at weekly intervals. During the course of investigation, rectal swabs were done on 60 separate infants, and it was found that 17 of these infants excreted E. coli type D 433 on one or more occasions. It was noted that the organism was isolated from as many as 11 of 12 infants who were examined on 12 or more occasions, but the organism was not found in 23 infants examined only once or twice.

Symptoms of infantile diarrhea and vomiting were observed in only 5 of the 17 infants with swabs containing the organism. Eleven infants had no symptoms at all while excreting E. coli type D 433. Five of these infants continued to excrete the organism for at least three weeks. In the course of a year, six infants who did not excrete E. coli type D 433 showed signs of diarrhea and vomiting, and symptoms associated with feeding difficulties occurred on 13 occasions. At one time as many as 10 of 15 infants in the home were excreting E. coli type D 433, but no outbreak of infantile diarrhea or vomiting occurred.

Previous authors have tried to show that there is an extremely high incidence of diarrhea associated with this type of E. coli in the stools. This report refutes their arguments somewhat, but the authors still think there may be some relationship to this organism with the onset of diarrhea, although it is stated that the part played by E. coli type D 433 in the origin of infantile diarrhea and vomiting remains uncertain. In this paper it is shown very definitely that an outbreak of diarrhea and vomiting did not follow the spread of the organisms among this group of patients, and there was no reason to believe that these infants were not susceptible to the disease.

This article is somewhat technical but is excellently written, and in order to get its full value it should be read in detail.

BIRDSONG, Charlottesville, Va.

MILD INFANTILE DIARRHEA TREATED BY SIMPLE DIETETIC MEASURES AND ORAL POTASSIUM. WILLIAM EMDIN, South African M. J. **25**:329 (May 19) 1951.

Two hundred patients with acute mild diarrhea were treated by partial starvation followed by feeding with half-skimmed powdered milk. A second group was given sodium-potassium-chloride-bicarbonate solution (Darrow) in addition. Eighty-nine per cent of the patients given potassium recovered, as against 69% of the other group. Addition of potassium resulted in prompt improvement in patients in the second group.

MCGUIGAN, Evanston, Ill.

REPORT OF A CASE OF INFANTILE CIRRHOSIS CRUVEILHIER-BAUMGARTNER WITH RECURRENT HEMORRHAGES, SPLENECTOMY, LIENORENAL ANASTOMOSIS, AND CURE AFTER ONE YEAR. P. SANTY, G. MOURIQUAND, N. BOULEZ, P. MARION, and D. DECHAVANNE, Pédiatrie **39**:510 (No. 4) 1950.

In a 10-year-old boy with a three-year history of attacks of hematemesis, a splenectomy and lienorenal anastomosis were performed, with the result that no further hemorrhages occurred and the child appeared clinically well for a postoperative observation period of one year. Microscopic examination of biopsy material showed cirrhosis of the liver and sclerosis of the spleen as seen in Banti's syndrome.

GLASER, Jerusalem, Israel.

CIRRHOSIS OF THE LIVER IN A PREMATURE DWARF AND HYPOPHOSPHATEMIC RICKETS. A. ECKSTEIN, Ann. pædiat. **175**:224 (Sept.) 1950.

Description is given of a patient who presented the signs of chronic cirrhosis of the liver with dwarfism in early infancy and hypophosphatemic rickets. In spite of administration of very high doses of vitamin D, the rickets did not improve. Unlike renal rickets as described by Ullrich and the syndrome described by De Toni-Fanconi, kidney function and the carbohydrate metabolism were normal. The clinical picture in this 12-year-old patient was different from the one which Gerstenberger calls hepatic rickets, so far as it developed only after infancy and the dwarfism became apparent at a very early age.

As it is not possible to explain the special type of rickets observed in this case in terms of the chronic liver damage, although a causal connection cannot be altogether refuted in view of importance of the liver for vitamin-D metabolism, the term hepatic rickets should not be used.

FROM THE AUTHOR'S SUMMARY.

THE QUESTION OF NAVEL COLIC. R. PREVOT and M. A. LASSRICH, Ann. pædiet. **177**:231 (Oct.) 1951.

Systematic investigations carried out in 40 children with "umbilical colics" led in about half the cases to the discovery of changes in the most distant part of the ileum, which Golden has called nonsclerosing ileitis. These apparently represent a hyperplasia of the lymphatic apparatus which need not necessarily be a sign of an inflammatory reaction but is observed also in well-nourished children, even in those who have grown up on a diet in which proteins predominated.

FROM THE AUTHORS' SUMMARY.

XEROPHTHALMIA AND INJURY OF THE MYOCARDIUM IN FIBROSIS OF THE PANCREAS. W. FEER, Schweiz. med. Wchnschr. **82**:102 (Feb. 2) 1952.

During the course of illness in a 5-month-old boy with a severe cystic fibrosis of the pancreas, verified at postmortem examination, there developed a xerophthalmia which responded to parenteral administration of vitamin A. After death a severe injury of the myocardium was also found.

AMBERG. Rochester, Minn.

ORALLY ADMINISTERED PLASMA IN THE MANAGEMENT OF SEVERE NUTRITIONAL DISTURBANCES OF INFANTS. E. PELUFFO, B. FRAU, J. NORDMOUN, and M. J. ABRIL DE BARRENECHE, Arch. argent. pediat. **36**:15 (July) 1951.

A preliminary report is made on the use of oral feedings of plasma in 12 infants with severe diarrhea.

PANOS, Galveston, Texas.

TWO CASES OF SUPERNUMERARY STOMACH. JULIO ESPENOZE S. and JOSE ALTAMIRANO P., Rev. chilena pediat. **11**:535 (Nov.) 1951.

Two cases of supernumerary stomach are reported, which were found among 3,838 autopsies, in children 5 months and 2 years old, respectively. In both cases there were multiple congenital anomalies.

FROM THE AUTHORS' SUMMARY.

METABOLISM OF KETONE BODIES IN CHILDREN WITH VON GIERKE'S DISEASE. M. ORSINI and G. STEGAGNO, Arch. ital. pediat. e puericolt. **14**:101 (No. 2) 1951.

The authors stress the importance of ketosis as a symptom in the whole picture of von Gierke's disease. They did research on the metabolism of ketone bodies in two patients affected with hepatic glycogen disease. They observed variations of ketonemia with prolonged fasting and adrenalin action upon the total and fractioned contents of ketonic bodies in blood and urine.

FROM THE AUTHORS' SUMMARY.

ANTIBIOTIC TREATMENT OF SEVERE DYSPEPSIAS IN YOUNG BABIES. C. FRANK, Arch. ital pediat. e puericolt. **14**:316, 1951.

Six premature infants and 24 babies up to 3 months old, with diarrhea mainly on the basis of Gram-negative bacteria sensitive to streptomycin, were treated with this antibiotic administered both orally and intramuscularly. The results were excellent; all patients recovered without complications. Another group of patients with diarrhea on the basis of germs resistant to streptomycin showed no improvement from the treatment.

FROM THE AUTHOR'S SUMMARY.

PNEUMOCOCCIC PERITONITIS. F. GELMI, Clin. pediat. **31**:547 (Oct.) 1949.

The following findings are helpful in making a differential diagnosis between pneumococcic peritonitis and peritonitis due to appendicitis. In pneumococcic peritonitis there is a moderate to high fever, diarrhea, diffuse pain, a flushed face with herpes and a white blood cell count between 25,000 and 35,000. In peritonitis due to appendicitis there is at first only a slight to moderate fever, constipation, epigastric pain which later tends to localize in the right lower quadrant, pallor, and a white blood cell count between 10,000 and 18,000.

Since the advent of penicillin therapy, only two of the last nine children with pneumococcic peritonitis in the surgical clinic at Bologna have died.

HIGGINS, Boston.

CONGENITAL DUODENAL STENOSIS FROM AN ABNORMALITY OF THE CHOLECYSTODUODENAL LIGAMENT: A RARE ABDOMINAL SURGICAL CONDITION IN A CHILD. A. RIGON, Clin. pediat. **33**:299 (May) 1951.

Two cases are reported. In one, a 3-month-old child presented the symptoms and signs of pyloric stenosis. Operation revealed partial obstruction of the duodenum from pressure of the cystoduodenal fold. A similar condition was found at autopsy in a newborn infant with anorectal atresia.

HIGGINS, Boston.

CONGENITAL DUODENAL STENOSIS. A. BARCAGLIA, Lattante **20**:670 (Nov.) 1949.

An infant of 4 months was found to have a stenosis of the third portion of the duodenum as a result of compression of the superior mesenteric artery. A gastroenterostomy was performed after the infant's condition had become critical, and the infant died. Autopsy was performed.

HIGGINS, Boston.

TWO CASES OF MALFORMATION OF THE INTESTINE IN NEWBORN INFANTS. A. RAVALICO, Lattante **20**:685 (Nov.) 1949.

In one newborn infant intestinal obstruction was due to a 20-cm. length of duodenum having atrophied into a fibrous cord. The other infant had an intestinal obstruction due to angulation and torsion at the third portion of the duodenum, where an adhesive mesenteric band bound together the duodenum and a loop of terminal ileum. The adhesion was removed surgically, and the child rapidly recovered.

HIGGINS, Boston.

PEPTIC GASTRODUODENAL ULCER IN CHILDHOOD AND ITS DIFFERENTIAL CHARACTERISTICS FROM ULCERS IN ADULTS. P. MAJONE, Minerva pediat. **1**:141 (April) 1949.

Of 581 patients hospitalized for gastroduodenal ulcer, 4 were between the ages of 11 and 15 years, and 12 others had abdominal symptoms dating back to the time when they were between 6 and 14 years old. The symptoms varied in different patients.

HIGGINS, Boston.

EPIDEMIOLOGY OF EPIDEMIC HEPATITIS IN INFANCY. B. LEIBER, Kinderärzt. Praxis **17**:301 (Sept.-Oct.) 1949.

Epidemic hepatitis occurred in an infant at the age of 81 days. The mother was ill with the same infection shortly after delivery, and she in turn was infected by her husband who returned from a prisoner-of-war camp shortly before he became sick, which was some 60 to 65 days before his wife's illness. The author feels that the rare occurrence of epidemic hepatitis in infants can be explained by transfer of immune bodies from the mother to the child. However, infants of mothers who have not been previously infected and who therefore do not carry immune bodies are as susceptible as older children or adults.

GLASER, Jersusalem, Israel.

Nervous Diseases

FAMILIAL OCCURRENCE OF TUBEROUS SCLEROSIS. WILLARD W. DICKERSON, A. M. A. Arch. Neurol. & Psychiat. **65**:683 (June) 1951.

Three families presenting multiple cases of tuberous sclerosis were studied by the author, and he has attempted to trace hereditary factors. He was unable to find any clear-cut pattern of transmission.

McGUIGAN, Evanston, Ill.

CONSERVATION OF TISSUE IN REPAIR OF MYELOMENINGOCELE IN THE NEWBORN. F. E. KREDEL, Ann. Surg. **131**:865 (June) 1950.

Myelomeningocele is one of the most frequent congenital malformations requiring treatment in newborn infants. Rupture of the sac, actual or imminent, is usually cause for emergency operation. The author presents his technic for conservative operation. The desirability is proposed of preserving all possible neural elements in the emergency repair.

BANTIN, Omaha.

THE USE OF SEDATIVE-INDUCED SLEEP AS AN AID TO ELECTROENCEPHALOGRAPHIC DIAGNOSIS IN CHILDREN. PETER KELLAWAY, J. Pediat. **37**:862 (Dec.) 1950.

Sedative-induced sleep is a valuable help to routine electroencephalography in children for the following reasons. 1. Latent epileptiform activity not present in a waking record may become manifest during sleep. 2. Convulsogenic foci may be localized during sleep, though waking records suggest a generalized convulsive state. 3. Sedative-induced sleep may increase the cooperation of difficult children. 4. Mild sedative doses of pentobarbital (nembutal®), to produce sleep in children, do not reduce the activating properties of this state.

MACDONALD, Pittsburgh.

PNEUMOCOCCAL MENINGITIS WITH HYPERGLYCEMIA AND DEVELOPMENT OF SUBDURAL EFFUSION: SUCCESSFUL TREATMENT WITH CHLORAMPHENICOL. HARRIS D. RILEY JR., J. Pediat. **37**:909 (Dec.) 1950.

Riley reports upon a 4-month-old infant with pneumococcic meningitis. In the acute phase of the disease the infant had hyperglycemia and glycosuria. During convalescence subdural effusion developed which was successfully relieved by puncture. The only antibiotic used was chloramphenicol in massive doses.

MACDONALD, Pittsburgh.

SALMONELLA BAREILLY MENINGITIS IN A CHILD SUCCESSFULLY TREATED WITH INTRAVENOUS AUREOMYCIN. EMANUEL PADNOS and MILTON GOLDIN, J. Pediat. **38**:85 (Jan.) 1951.

Meningitis caused by Salmonella bareilly is extremely rare. This patient recovered. Treatment was with aureomycin intravenously.

MACDONALD, Pittsburgh.

THE OCCURRENCE OF LYSOZYME IN THE CEREBROSPINAL FLUID AND SERUM OF INFANTS AND CHILDREN. EDWARD F. RABE and EDWARD C. CURNEN, J. Pediat. **38**:147 (Feb.) 1951.

Lysozyme, not usually detectable in the cerebrospinal fluid of normal children, was found in slightly increased titers in children with nonbacterial meningoencephalitis and in highest titers in children with purulent bacterial meningitis. Elevated titers were present in the absence of pleocytosis. It would seem that lysozyme in the cerebrospinal fluid is derived mainly from sources intrinsic to the host and, in some instances, may be a sensitive index of inflammation of the central nervous system.

MACDONALD, Pittsburgh.

HEMOPHILUS INFLUENZAE PYARTHROSIS AND MENINGITIS TREATED WITH AUREOMYCIN. BLACKBURN S. JOSLIN and ANN HOWARD, J. Pediat. **38**:375 (March) 1951.

Aureomycin in a dosage of 100 mg. every 4 hours was administered orally to an infant with Hemophilus influenzae pyarthrosis and meningitis. After six days, a low-grade fever persisted, and aureomycin was given intravenously, 50 mg. every four hours for 80 hours. Oral administration of aureomycin was then resumed and continued for four more days. The child recovered but has residual damage in brain and joints.

MACDONALD, Pittsburgh.

SUPRASELLAR (RATHKE'S POUCH) CYST. ALEXANDER C. JOHNSON and JOHN M. MEREDITH, J. Pediat. **38**:380 (March) 1951.

The authors present a case of suprasellar cyst first seen at the age of 4 years. Their original impression was chorea. A little later the impression was changed to encephalitis. Two months later papilledema had developed, and a diagnosis of brain-stem tumor was made. Because of increased intracranial pressure, ventriculography was performed and the cyst discovered. The cyst was drained, and the child was given x-ray therapy. The papilledema disappeared, and he improved. Eight months later drainage was repeated. Calcification of the suprasellar region was first seen three and one-half years after his first admission. About two years after the onset of symptoms pubertas praecox developed. Except for occasional convulsions he is well five and one-half years after the initial surgical drainage of the cyst and x-ray treatment.

MACDONALD, Pittsburgh.

THE ROLE OF THE RH FACTOR IN THE ETIOLOGY OF CEREBRAL PALSY. IRWIN PHILIP SOBEL and HAZEL S. WILHELM, J. Pediat. **38**:447 (April) 1951.

Of 98 children with cerebral palsy studied, only 3 had kernicterus. The authors believe that maternal isoimmunization to the Rh factor plays only a slight role in the pathogenesis of cerebral palsy.

MACDONALD, Pittsburgh.

THE SIGNIFICANCE OF DELAYED DEVELOPMENT IN THE DIAGNOSIS OF CEREBRAL PALSY. ERIC DENHOFF and RAYMOND H. HOLDEN, J. Pediat. **38**:452 (April) 1951.

Delay in development may be an important diagnostic aid in otherwise-unsuspected cerebral palsy. Of 100 cerebral palsy children 68 in this study showed delayed neuromuscular development as early as at 3 months of age. From the authors' data it would seem that there is a correlation between the age of first speaking two- or three-word sentences and intellectual function in these children.

MACDONALD, Pittsburgh.

TYPE F HEMOPHILUS INFLUENZAE MENINGITIS. PHILIP ROSENBLATT and BEN M. ZWEIFLER, J. Pediat. **38**:620 (May) 1951.

Type f Hemophilus influenzae meningitis is rare. The authors report a case in a 10-month-old infant, with recovery. The infant was treated with streptomycin and sulfadiazine for four days without striking improvement. The addition of penicillin to the therapy on the fourth day of treatment was followed by prompt improvement. Because type f H. influenzae is susceptible to penicillin, combined therapy with streptomycin, sulfadiazine, and penicillin is recommended for infections with this organism.

MACDONALD, Pittsburgh.

MUSCLE TRAINING FOR CEREBRAL PALSIED SPEECH CASES. HAROLD WESTLAKE, J. Speech & Hearing Disorders **16**:103 (June) 1951.

Careful attention should be given to the use of motor training in speech therapy in cerebral palsy cases. A detailed scrutiny of muscle activity and patterns of movement frequently reveals remediable defects which interfere with speaking efficiency. Systematic evaluation and muscle-training technics offer a great deal to the speech therapist.

PALMER, Wichita, Kan.

CEREBRAL PALSY PROFESSIONAL TRAINING ACTIVITIES IN THIS COUNTRY. MARTIN F. PALMER, J. Speech & Hearing Disorders **16**:157 (June) 1951.

Only a few professional training schools in the field of speech disorders are offering separate academic materials in the speech disorders of cerebral palsy. A number of other professional training institutions offer incidental lecture material.

PALMER, Wichita, Kan.

EFFECT OF LEUCOCYTES AND BACTERIA ON GLUCOSE CONTENT OF THE CEREBROSPINAL FLUID IN MENINGITIS. SIDNEY GOLDRING and CARL G. HARFORD, Proc. Soc. Exper. Biol. & Med. **75**:669 (Dec.) 1950.

The authors sought to throw some light on the reason for marked decrease in glucose in the cerebrospinal fluid in meningitis. Tests were carried out with cerebrospinal fluid of four dogs with aseptic meningitis, wherein the concentration of glucose was essentially normal. The rate of the utilization is higher in the fluids with higher cell counts. In four animals with pneumococcus meningitis the values obtained were lower. In vitro studies were also conducted in an attempt to show variations of glucose concentration in bacterial cultures. Very large numbers of pneumococci, growing rapidly, were needed to consume glucose at rates approximating those at which glucose is utilized in aseptic meningitis. The authors believe that consumption of glucose by leucocytes and bacteria does not account for the lowered levels of glucose in bacterial meningitis.

HANSEN, Galveston, Texas.

SPASMUS NUTANS. C. W. KESSON, Proc. Roy. Soc. Med. **42**:562 (July) 1949.

A case of spasmus nutans is reported in a boy aged 9 months. The history, family history, results of physical examinations and investigations are presented.

WILLIAMSON, New Orleans.

RECURRENT FLACCID PARALYSIS: REPORT OF A CASE. IVAN MAGAREY, Clin. Rep. Adelaide Child. Hosp. **2**:26 (May-Nov.) 1951.

The author describes two attacks of flaccid paralysis occurring four years apart in a young boy. No diagnosis could be made other than a possible infective polyneuritis.

MCGUIGAN, Evanston, Ill.

THERAPEUTIC INDICATIONS OBTAINED FROM ELECTROENCEPHALOGRAPHY IN EPILEPSY IN CHILDREN. JEAN COURJON, Pédiatrie **39**:451 (No. 4) 1950.

Electroencephalography, new drugs, and progress in neurosurgery during the last years have changed the therapeutic approach to epilepsy. Electroencephalographic studies permit the proper selection of drugs or the accurate indications for surgery. Six illustrations of electroencephalograms demonstrate the findings in various forms of epilepsy. GLASER, Jerusalem, Israel.

PROBLEM OF SURGICAL TREATMENT OF FOCAL EPILEPSY. G. WEBER, Schweiz. med. Wchnschr. **81**:1291 (Dec. 29) 1951.

Of 1,169 epileptics, 88 were submitted to surgical treatment, in the absence of any evidence of a space-consuming intracranial lesion. It is concluded that surgical treatment of a focal epilepsy is indicated only when optimal medical measures have been unable to make the condition sufferable, and when the epileptogenic focus is not due to a progressive cerebral lesion. It must be made clear to the patient or to his family that success cannot be promised definitely.

AMBERG. Rochester, Minn.

TREATMENT OF SUPPURATIVE MENINGITIS IN THE CHILD BY THE EXTRAMENINGEAL ROUTE. J. BONABA and JOSE M. PORTILLO, Rev. peruana pediat. **19**:5 (Oct.-Dec.) 1949.

The authors report their experience in the treatment of purulent meningitis in children from a study of the patients admitted to the Instituto de Clinica Pediatrica e Higiene Infantile in Montevideo, those admitted to the Hospital Pedro Visca in the same city, and some from private practice.

They consider that their method of treatment is completely justified for the following reasons: (1) the demonstration of the passage of antibiotic drugs to the meninges (especially when patients are ill) even though administered extrathecally; (2) the inconveniences that result from intrathecal administration of drugs; (3) the disadvantages of the extraction of cerebrospinal fluid (especially in cases of purulent meningitis), and (4) the experience of foreign authors and themselves concerning the possibility of effecting recovery from purulent meningitis by this method.

This study was carried out in a little more than one year. There were 28 cases of purulent meningitis, principally in infants (64.2%) of whom more than one-half were one year old. As etiological agents, Pneumococcus was found in 21.4%, Meningococcus in 25%, including cases of Hemophilus influenzae, and Escherichia coli in one case. In a high percentage of cases (42.8%) it was impossible to establish the nature of the causative germ. Sixty-seven and eight tenths per cent had severe meningitis.

Treatment was by the extrathecal route exclusively, with three drugs (sulfonamides, penicillin, and streptomycin) during the whole course of treatment. The doses were not the same in all cases, since the patients came from different places and were treated by different physicians. The authors point out that a rigid criterion in the doses must be used only at the beginning of treatment, and with the following schedules, especially for infants: sulfadiazine, 0.50 gm. per kilogram of weight per day; penicillin, 50,000 units per kilogram per day; streptomycin, 50 mg. per kilogram per day. Further doses must be managed according to the clinical course and the state of the fluid, and one need not be afraid to be generous with the drugs since they are generally well tolerated by children. The authors emphasize the need for controlling the passage of drugs into the cerebrospinal fluid by means of a study of the drug levels. Caution must be used in frequent repetition of evacuating lumbar punctures. The intrathecal route must be reserved for those patients for whom treatment has proved definitely inefficient.

In this study there was no mortality, although the great majority of patients had severe meningitis. The course of the syndrome of meningitis was rapidly favorable in 24 cases. Temperature became normal between one and eight days in 23 cases. The existence of complications and sequelae was exceptional. The cerebrospinal fluid generally became normal in the first days of treatment. Reduction of proteins and cells was also early. Complete normalization of the cerebrospinal fluid took more time than clinical recovery, appearing usually between the 10th and 15th day.

The authors emphasize the advantage of this method of treatment, and they propose to use it systematically in the treatment of children with purulent meningitis.

FROM THE AUTHORS' SUMMARY.

DIFFERENTIAL DIAGNOSIS OF SEROUS MENINGITIS IN CHILDREN (WITH CASE REPORTS). FRITZ KUSKE, Arch. Kinderh. **139**:113 (No. 3) 1950.

The author presents a brief outline of the history, the literature, and present opinions on differential diagnosis. Six cases are reported demonstrating difficulties in differential diagnosis. Diagnosis on the basis of analysis of the fluid is often not conclusive, since various etiological types may show identical cells. The most important task of the clinician is to determine the presence of otogenous or tuberculous serous meningitis as soon as possible.

GOTTSTEIN, Chicago.

CLINICAL, ETIOLOGICAL AND EPIDEMIOLOGICAL INVESTIGATIONS OF AN EPIDEMIC VIRUS MENINGITIS. KURT FERDINAND BINGAL and MARTIN SCHUSTER, Deutsche med. Wchnschr. **75**:1652 (Dec. 8) 1950.

In the vicinity of Heidelberg an outbreak of a peculiar epidemic occurred. One-hundred forty patients aged 5 months to 51 years could be studied, and a further 120 also had the disease in all probability. The onset was sudden; children became ill while playing, adults became ill when at work, and sometimes the onset was during sleep. Severe headache of frontal and orbital region was noted first. Fever, nausea, and vomiting were usually present. In small children the vomiting was persistent. Meningitic symptoms, such as stiffness of the neck, Kernig's sign, and others, occurred even if at times they were of short duration. Only in three cases was the spleen slightly enlarged. The cell count of the cerebrospinal fluid was usually increased, mainly that of the polymorphonuclear cells. The blood presented leucopenia, as a rule, with predominant neutrophile cells. At the beginning, angina was noted frequently with tonsillitis. The virus could be passed in guinea pigs, cats, and field mice, as well as in eggs. It could be demonstrated in 20% of the field mice examined. Eighty-seven cases of the 142 occurred in children under 15 years old. The epidemic started in a kindergarten.

AMBERG, Rochester, Minn.

DIAGNOSIS OF MIGRAINE IN CHILDHOOD. E. SCHIFF, Deutsche med. Wchnschr. **76**:1003 (Aug. 17) 1951.

Attention is called to the abdominal migraine of children, in which nausea, vomiting, and abdominal pain are often the prominent symptoms. The history of a boy patient is given who was 12 years old when first seen and who was observed for about seven years. During this time he had a number of attacks, characterized by vertigo, severe headaches, and vomiting. Only once did he complain of severe abdominal pain when the headache was slight. The attacks lasted one to two days. Between attacks no abnormalities were demonstrable. During the attack, bradycardia upon lying down was a prominent feature. Upon rising the frequency of the pulse increased. Upon electrocardiographic examination a sinus bradycardia was found in the patient and also in the father, who also had suffered since childhood with migraine. The hereditary factor is stressed.

AMBERG, Rochester, Minn.

ENTEROCOCCUS MENINGITIS AND ITS TREATMENT. ANNELISE ROBBY, Med. Klin. **44**:1629 (Dec. 23) 1949.

The patient, a 13-year-old girl, became ill with signs of meningitis. Numerous cells and Streptococcus fecalis were found in the cerebrospinal fluid. She was treated with a combination of a sulfonamide and penicillin. Fourteen days after cessation of penicillin therapy, when all clinical symptoms had disappeared and the number of cells in the cerebrospinal fluid had dropped to 37, Streptococcus fecalis was still demonstrable upon culture. The rarity of meningitis due to Streptococcus fecalis is stressed. Penicillin is credited with the good therapeutic result.

AMBERG, Rochester, Minn.

UNSPECIFIC THERAPY (CHOREA MINOR) IN THE LIGHT OF NEW VEGETATIVE-REGULATORY LEUCOCYTIC REACTION. O. THALHAMMER and L. JANICEK, Wien. klin. Wchnschr. **63**:198 (March 16) 1951.

Upon injections of olive oil, cow's or human milk, or a person's own blood, leucocytosis occurs, usually within the first 24 hours, receding rapidly. After a period of about 7 to 11 days, a renewed transitory leucocytosis occurs. Older children react less. This leucocytosis is not accompanied by any clinical symptoms. This reaction is regarded as a vegetative-regulatory process and is further regarded as a subclinical anaphylaxis. A correlation is seen with the effect of various treatments of chorea minor when such treatments are effective.

AMBERG, Rochester, Minn.

IRRITATIVE REACTION IN THE SPINAL FLUID FOLLOWING LUMBAR PUNCTURE. W. KÜNZER, Ztschr. Kinderh. **66**:135 (No. 1-2) 1948.

In order to investigate the possible influence which well-done lumbar puncture has on the spinal fluid composition of normal infants, the author studied the cell count, protein and sugar levels, and mastix curve in normal infants. He performed punctures on the 2d, 4th, 6th, 8th, 10th, and 14th days following the first puncture and found that two days following the initial puncture the cell count increased materially (lymphocytes), whereas total protein and sugar values remained the same and the mastix curve remained normal. These changes returned to normal by the 10th day. If blood was drawn at the time of the first tap, the findings did not differ from those described above. If more than one puncture was performed on one infant, the cerebrospinal fluid findings nevertheless returned to normal 10 days after the last tap. The author believes that the disturbance of the fluid dynamics causes a mechanical irritation of the meninges, an aseptic meningitis. If large amounts are withdrawn or if the rate of flow is rapid, the reaction will be more severe. The irritative effect of lumbar puncture seems to be less in cases of central nervous system pathology.

GLASER, Chicago.

CONTINUOUS DRAINAGE OF SUBDURAL CEREBROSPINAL FLUID. F. GERLOCZY and J. GALAMBOS, Paediat. danub. **6**:149 (Sept.) 1949.

After a detailed discussion of the mechanism of air accumulation in the subdural space and of the so-called external hydrocephalus, the case of a 5-month-old infant suffering from microcephalus and idiocy is reported. Repeated encephalography revealed significant subdural accumulation of cerebrospinal fluid on both sides (cerebral atrophy). At the age of 7 months decompression was performed. After the opening of the dura mater, a jet of cerebrospinal fluid shot from the subdural space. In order to prevent further accumulation of fluid, one end of a rubber tube was introduced into the subdural space and the other end into the trapezius muscle. According to control examinations, drainage remained continuous and the symptoms of postoperative increased intracranial pressure, such as hyperkinesis, athetosic movements, clonic spasms, etc., all disappeared within a few months. Rigidity of the pupils to light and neutrality of the patient towards his surroundings were promptly relieved. Naturally, consequences of the cerebral atrophy (oligophrenia, etc.) remained unchanged. It is planned to solve the drainage of the cerebrospinal fluid on the other side and also to relieve the synostoses by a second operation.

FROM THE AUTHORS' SUMMARY.

CEREBRAL TUMORS IN CHILDHOOD. Z. BRUNECKY, Pediat. listy **6**:623, 1950.

This is a report on 30 children examined and treated for cerebral tumors at the University Children's Hospital, Brno. The diagnosis was confirmed upon operation or at autopsy in all cases. The localization of the tumors was subtentorial in 60% and supratentorial in the remaining 40 The incidence in the sexes was equal. Upon histologic examination 90% of the tumors turned out to be gliomas. The methods of examination and the diagnostic difficulties are analyzed; the potientialities of treatment are evaluated. Of 30 children only 12 were operated upon, and in only four cases was complete recovery effected (after operation). In the remaining cases deep x-ray therapy did not substantially influence the fatal course of the disease.

FROM THE AUTHOR'S SUMMARY.

COMBINED SULFONAMIDE-PENICILLIN TREATMENT OF ACUTE PURULENT MENINGITIS AND A FOLLOW-UP STUDY. T. TORSTENSON, Acta pædiat. **37**:377 (No. 5-6) 1949.

Combined sulfonamide and penicillin treatment of patients with acute purulent meningitis has given promising results. The sulfonamides have been given orally in large doses and the penicillin intramuscularly (100,000 to 300,000 units a day) and intraspinally (10,000 to 20,000 units once or twice a day). Twenty-seven of 3 patients survived. Of 19 infants only 3 died. A follow-up study shows that 19 of 27 were cured without any or with merely unimportant sequelae. Five patients still show signs of cerebral injuries, and three show markedly delayed psychomotor development and psychasthenic symptoms. Furthermore, this study shows that (1) the survivors among the infants had the most serious injuries; (2) serious symptoms in the beginning are not invariably unfavorable; (3) prognosis for the pneumococcic type of meningitis is perhaps less favorable; (4) prognosis cannot be based on the number of cells in the cerebrospinal fluid, and (5) the risk involved in giving endolumbar injections of penicillin cannot be great.

FROM THE AUTHOR'S SUMMARY.

CONGENITAL FACIAL DIPLEGIA. BO HELLSTRÖM, Acta pædiat. **37**:464 (No. 5-6) 1949.

An account is given of two cases of congenital facial paralysis combined with oculomuscular paralysis and atrophy of the muscles of the tongue. One of these was thoroughly investigated by air encephalography and electromyography, among other methods. The air encephalogram showed a widening of the basal cisterns, reflecting a hypoplasia of the brain stem. Electromyography showed partial activity of the muscles of expression on one side, indicating sparse intact innervation, despite the fact that, clinically, the diplegia appeared complete.

FROM THE AUTHOR'S SUMMARY.

CHANGES IN THE ALPHA FREQUENCY OF HUMAN BRAIN POTENTIALS IN NORMAL AND PATHOLOGICAL CONDITIONS. L. E. LARSON, K. A. MELIN, G. ÖHRBERG, and K. ÖHRBERG, Acta pædiat. **38**:44 (No. 5-6) 1949.

Changes in the alpha frequency of the electroencephalogram over a 10-year-period have been examined in 60 normal children. A comparison has been made with the corresponding changes in 21 children with pathological conditions (mongolism, spasticity, mental deficiency), and the authors have found a tendency to a less-regular increase of the alpha frequency in those with pathological conditions.

FROM THE AUTHORS' SUMMARY.

AN EPIDEMIC OF POLYNEURITIS IN A FAMILY. J. WICKSTRÖM, Nord. med. **39**:1313 (July 9) 1948.

A family epidemic of polyneuritis is reported. Ten persons were affected with gastrointestinal symptoms, and after a latent period of 12 to 45 days there occurred benign polyneuritis in eight cases. There was no dissociation of protein and cell content of the cerebrospinal fluid. The author is of the opinion that the polyneuritis was due to an alimentary infection.

WALLGREN, Stockholm, Sweden.

ACUTE DIFFUSE INFANTILE SCLEROSIS OF THE BRAIN (TYPE KRABBE). K. KAIJSER and C. V. LUNDQUIST, Nord. med. **39**:1355 (July 16) 1948.

The authors report upon a 13-month-old girl who died of Krabbe's disease At 4 months she began to show increasing mental retardation, rigidity of the extremities, tonic spasm in the whole body, digestive disturbances and difficulty in eating, vomiting, loud screaming, periodical fever, and blindness. At the postmortem examination there were widespread sclerotic changes in the central nervous system, especially marked in the cerebellum and central ganglions and found even in the hemispheres. The spinal marrow was also the seat of sclerotic changes. Microscopic examination showed increase of glia tissue and degeneration of the white matter, typical of the disease described by Krabbe in 1916. Chemical examination showed that there was a paucity of lipids in the white matter. The girl had a brother who died at the age of 6 months

from a similar illness. Furthermore, two aunts of the father were afflicted with a sickness which gradually led to paralysis of the arms and legs, which made them invalids from the age of 26. The nature of this disease is uncertain. There is only one case of Krabbe's disease previously published from Sweden (Brandberg: *Nord. med.* **4**:3558, 1939).

WALLGREN, Stockholm, Sweden.

ELECTROENCEPHALOGRAM IN SOME CASES OF MENINGOENCEPHALITIS. E. BÖRJE HOLMGREN, Nord. med. **40**:1810 (Oct. 8) 1948.

Twelve patients with meningoencephalitis were studied by means of electroencephalograms. In acute and subacute stages all electroencephalograms were abnormal, but in postacute stages only four tracings out of seven were abnormal. The results correspond with the findings reported by Gibbs and Gibbs.

WALLGREN, Stockholm, Sweden.

ELECTROENCEPHALOGRAPHIC THERAPEUTIC CONTROL IN EPILEPSY. K. A. MELIN, Svenska läk-tidning. **46**:595 (March 18) 1949.

If the electroencephalogram is normalized through drug treatment, the drug may be tentatively withdrawn. After a few weeks it is necessary to make a new electroencephalogram in order to determine whether pathologic changes have reappeared. If they have reappeared, drug therapy should again be begun. If the electroencephalogram remains abnormal, the drug treatment should not be interrupted, because grand mal and sometimes status epilepticus may appear.

WALLGREN, Stockholm, Sweden.

CASE OF PHRENIC NERVE PARALYSIS. VAN RAVESTEYN-LE MAIR, VAN RAVESTEYN, and H. M. C. POORTMAN, Maandschr. kindergeneesk. **17**:326 (No. 10) 1950.

Description is given of a patient with phrenic paralysis accompanied by paralysis of the brachial plexus, due to birth trauma (difficult delivery), with ultimate recovery. The author remarks that, while in all the cases found by him in the literature definite signs appeared within 24 hours, the signs in this case did not appear till after the 26th day.

FROM THE AUTHOR'S SUMMARY.

POSTERIOR ARACHNOIDITIS DUE TO NEMATODES. T. P. J. BOTMAN, Maandschr. kindergeneesk. **19**:141 (June) 1951.

The author describes a case of posterior arachnitis, originating from a presumably severe infection with Ascaris lumbricoides, occurring in a young Chinese child. Microscopic examination gave the impression that the migrating Ascaris larvae were the cause of the meningitis.

FROM THE AUTHOR'S SUMMARY.

Psychology and Psychiatry

EVALUATION OF INTELLIGENCE AND INTELLIGENCE QUOTIENT IN THE CHILD. J. PEISER, Ann. pædiat. **178**:27 (Jan.) 1952.

Five types of intelligence can be distinguished: theoretical-abstract, practical-concrete, subconscious-intuitive, prelogic-paralogic, and social. Judgement of intelligence depends upon which of its forms is placed in the foreground, but besides that it is necessary to discriminate between capacity and ability. The pediatrician is primarily interested in natural intelligence. This can be examined by different kinds of tests which should have no connection with cultural milieu, education, or schooling but should be built up on pure reasoning. The degree of intelligence can be expressed by the I.Q. in figures. Whether this I.Q. can be increased is a debatable point, but that it can be, has been recently accepted by several authors. The author's observations prove that in oligophrenic children the I.Q. may be increased in special training homes. This may be due to a fostering of the maturing of the child's whole personality.

FROM THE AUTHOR'S SUMMARY.

NEUROTIC REJECTION OF SCHOOL. C. SAINZ DE LOS TERREROS, Acta pediat. españ. **9**:617 (May) 1951.

The author feels that pediatricians are often confronted with the problem of absenteeism in school children and that they should be able to differentiate between the common truancy of normal children and that of children who suffer from some form of psychic trauma leading to an acute neurotic rejection of school. In the latter, there is acute anxiety, aggression, and some symptoms of projection.

Family relations usually include an overprotective mother, but frequently, as in the cases of Warren reviewed here, a mother or father may have left the family for a trip without explanation to the child. These children may exhibit depression and mutism and, as MacBurgs believes, may manifest schizophrenia later.

Adequate psychotherapy is absolutely indicated, and removal from the family for a period of time may be advisable.

ALLEN, Santa Fe, N. M.

PRELIMINARY NOTE REGARDING RESULTS OF APPLIED PSYCHOLOGY IN THE SCHOOLS, A GUIDANCE CENTER. VIEGA, Acta pediat. españ. **9**:622 (May) 1951.

Viega describes his experiences with 117 children sent by the schools for psychological testing and therapy. The center is a part of the Institute of Medical Anthropology at Barcelona. Of the 117 children between the ages of 6 and 16 years, 55 were deficient in school work, 44 had personality defects, 16 had family conflicts, and 2 were juvenile delinquents. None of the children had any physical defects, such as defective hearing, loss of vision, or malnutrition. There were instances of reading and writing defects, inattention, enuresis, hyperactivity, mental and physical slowness, daydreaming, etc.

None of these children was given group therapy, but later they may be included in groups if it is felt helpful. Psychodrama may also be used later.

The usual tests such as thematic apperception, Terman, etc., were given. Play therapy was used, especially with the smaller children. Each child participated in from 6 to 10 sessions. Also, parents and teachers were given guidance in the handling of individual children.

Results to date show (1) 20% greatly improved, all of them having high I.Q.'s; (2) good results in 38%, of medium or average intelligence; (3) moderate improvement in 12%, children having an I.Q. of 80 or less, and (4) no improvement in 30%, due to noncooperation, and insufficient therapy. This group included children with both high and low I.Q.'s.

ALLEN, Santa Fe, N. M.

RELATION OF LEFT-HANDEDNESS TO LEARNING AND PERSONALITY ALTERATIONS IN THE CHILD. TELMA RECA DE ACOSTA and ANA MATILDE MONTDOR, Arch. argent. pediat. **36**:96 (Aug.) 1951.

Five case histories are presented, illustrating that in left-handed children who are forcefully converted to right-handedness reading, writing, and personality difficulties develop.

PANOS, Galveston, Texas.

PSYCHOLOGY OF THE HANDICAPPED CHILD. D. KATZ, Lattante **22**:193 (April) 1951.

Orthopedically handicapped, blind, deaf, or maladjusted children are likely to have feelings of insufficiency, isolation, and weakness. These tendencies are best combated by expressions of sympathy, confidence, and praise. The child must receive assurance that his efforts are worthwhile.

HIGGINS, Boston.

CLINIC OF PSYCHOSES IN CHILDHOOD. V. STOCKERT, Wien. klin. Wchnschr. **62**:831 (Nov. 3) 1950.

Some of the features of endogenous psychoses in childhood are illustrated by cases. In one of these the illness started, when the child was 12 years old, with deterioration of his school work for several weeks. Later he had periods of mania changing to depression, but he was able

to finish school (*Gymnasium*). Ten year later, after another psychotic period, he presented the remnants of schizophrenia. Another boy, whose illness started at the age of 13 years, gave the impression of schizophrenia apparently responding to shock treatment. Later periods of depression occurred, but at the age of 19 he appeared to be normal. Some cases show that compulsion syndromes may have a different outlook. Thus in one boy of 12 years, in whose family several suicides occurred, the compulsion ceased entirely, so that only the family history suggested the possibility of a periodic psychosis. In another boy whose compulsion started at the age of 10 years, the compulsion ceased following insulin shock treatment, but later he presented the picture of a schizophrenic defect. It was possible to observe children who had been treated with streptomycin for tuberculous meningitis. In some of these, psychotic states persisted for months, with features similar to those of subacute lethargic encephalitis. Besides delirium, amnesia was a prominent symptom.

AMBERG, Rochester, Minn.

SOMATIC DISORDERS AS CAUSES OF BEHAVIOR PROBLEMS. OLUF ANDERSEN, Acta pædiat. **38**:30, 1949.

The author points out the effects that somatic disease may have upon the behavior of children. Two cases are presented. A 9-year-old boy with headache and behavior problems improved after an adenoidectomy for chronic upper respiratory infection. In the second case, that of a 9-year-old boy who also had headache and psychological difficulty, the condition proved to be renal hypoplasia with hypertension.

The author stresses the care with which mental symptoms of children must be assessed, pointing out that children with even minor somatic lesions easily become irritable and unbalanced. Therefore it is necessary to examine children with behavior difficulties thoroughly, taking somatic diseases into consideration, before one accepts the diagnosis of environmental difficulties.

FROM THE AUTHOR'S SUMMARY.

FUNCTIONAL DEVELOPMENT DURING INFANCY. ARVID WALLGREN, Acta pædiat. **38**:637, 1949.

The normal variation in mental and postural development has been studied in a number of healthy children from the child health center of the Gothenburg Children's Hospital. When statistically calculated, the normal variations of different functions show a great difference. Early achievements, such as prehension and sitting without support, show very slight variations. More advanced functions, e. g., walking capacity and excretory control, are much more individually variable. A simple diagram of functional development during infancy, intended for general use in the Swedish children's welfare centers, is presented.

FROM THE AUTHOR'S SUMMARY.

SOME PROBLEMS CONCERNING MONGOLISM IN THE NEWBORN: DIAGNOSIS, INCIDENCE, AND ETIOLOGY. JACOB ØSTER, Acta pædiat. **40**:338 (July) 1951.

As part of a major investigation into mongolism in Denmark, 65 mongoloids were found among 84,072 live-born babies (1 in 1,293) in the two maternity departments of the University Hospital in Copenhagen during the period 1923-1948, inclusive. During the period 1938-1948, inclusive, one of the departments had 32 cases among 20,391 live-born babies (1 in 637). The latter finding is considered to be closer to the true incidence at birth.

The difficulties connected with early diagnosis are mentioned. In about 21% of cases the condition either was not diagnosed or was diagnosed erroneously immediately after birth. A follow-up examination was conducted two years after the birth of the last child included in the series. At that time 44 (66.7%) had died, 32 (49.2%) of them during the first year of life. The presumed cause of the condition is briefly mentioned, and the health of the mothers before and during pregnancy is described, but no conclusions are drawn, since the series is small and not representative.

FROM THE AUTHOR'S SUMMARY.

Diseases of Genitourinary Tract

UROLOGICAL PROBLEMS IN INFANTS AND CHILDREN. KNOWLTON E. BARBOUR, Illinois M. J. **99**:207 (April) 1951.

Certain lesions of the urinary tract in children may be overlooked if pyelography and cystography are not employed. Further urological study is indicated when the pyelograms are not within normal limits. Symptomatically, urogenital-tract pathology frequently simulates gastrointestinal-tract pathology. The urogenital tract should not be overlooked in these cases in spite of negative findings on urinalysis.

FROM THE AUTHOR'S SUMMARY.

COMMON CONGENITAL LESIONS OF THE URINARY TRACT. EDGAR BURNS and B. MARVIN HARVARD, J. A. M. A. **146**:419 (June 2) 1951.

Congenital lesions producing obstructions may be found at any point in the urinary tract, from the ureteropelvic junction to the urethral meatus. Various operations to correct these defects, which may be multiple, are described.

KIMBALL, Evanston, Ill.

THE TREATMENT OF HYDROCELE OF THE TUNICA VAGINALIS. J. MCLEAN ROSS, Edinburgh M. J. **57**:413 (Sept.) 1950.

Idiopathic hydroceles appear in adolescents or adults without evidence of associated disease or injury. Ross treated 45 such patients with injection of a solution containing 4 gm. of quinine hydrochloride and 2 gm. of urethane to 100 cc. of water. In the 40 patients who could be followed, there were two failures.

MACDONALD, Pittsburgh.

A CASE OF CONGENITAL CYSTINURIA. H. PRAKKEN, Maandschr. kindergeneesk. **19**:204 (Aug.) 1951.

A description is given of a case of congenital cystinuria with associated lysinuria and oxalate calculosis in a little boy. Disturbances of micturition caused by bladder stones started as early as the age of 2 years. Observations pointed to a disturbance in the tubular reabsorption of cystine and lysine.

Choline was administered to the child on the supposition that this substance can supply the methyl groups for the conversion of homocysteine into methionine, the opposite of one of the reactions in the catabolism of methionine to cystine. Sodium benzoate was administered by mouth, with the aim of dissolving the stones by a higher concentration of hippuric acid in the urine. The accompanying colipyuria soon disappeared. With continued treatment no stones were visible roentgenologically after one year and four months.

Cystinuria without crystal formation was found in the fresh urine of the father, and a little sister showed lysinuria in the neonatal period and later, without cystinuria and without or with only slight excretion of the other free amino acids.

FROM THE AUTHOR'S SUMMARY.

FAMILIAL CYSTIC DISEASE OF THE KIDNEY AND SPINA BIFIDA. D. P. R. KEIZER and H. A. LAAN, Nederl. tijdschr. geneesk. **94**:2741 (Sept. 23) 1950.

Three siblings died shortly after birth, as a result of cystic disease of the kidney. In one of them the diagnosis was confirmed by autopsy. Other members of this family presented no renal malformations upon examination. The mother and four other siblings had spina bifida. Although spina bifida occurs much more frequently than congenital cystic disease of the kidney, the authors are of the opinion that a certain relationship between these two anomalies cannot be denied. Two other patients also presenting the combination of cystic kidneys and spina bifida are described.

VAN CREVELD, Amsterdam, Netherlands.

Diseases of Ductless Glands; Endocrinology

ACTION OF CORTISONE ON THE EXCRETION OF 17-KETOSTEROIDS AND OTHER STEROIDS IN PATIENTS WITH CONGENITAL HYPERPLASIA OF THE ADRENALS. LAWSON WILKINS, ROGER A. LEWIS, ROBERT KLEIN, and EUGENIA ROSENBERG, Helvet. paediat. acta **5**:418 (Nov.) 1950.

Cortisone in doses of 25 to 100 mg. per day caused decreased excretion of 17-ketosteroids and other steroids derived from the adrenal in the six cases of congenital adrenal hyperplasia studied. There was a tendency for the response to be more rapid when the larger doses were used. In most instances 25 mg. of cortisone a day reduced the urinary 17-ketosteroid excretion to as low a level (4 to 8 mg. per day) as did the larger doses. However, in one patient the 17-ketosteroids fell to only 10 to 14 mg. while she was receiving 25 mg. daily but declined to 4 to 8 mg. when the dose was increased to 50 mg.

When treatment was continued as long as 48 days, there was no tendency for the suppression of 17-ketosteroid excretion to become less. During the early stages of treatment with 25 mg. of cortisone daily the stress of an acute infection caused a marked temporary increase in the output of adrenal hormones. It is not known whether long-continued treatment with cortisone would cause progressive diminution in the ability of the adrenal to respond to stress.

The urinary steroids were altered similarly to the 17-ketosteroids; however, the effects of cortisone on the excretion of neutral-reducing lipids (11-oxysteroids) were more irregular, due probably to the fact that a portion of cortisone is excreted in this fraction of the urine.

In the doses given, cortisone caused moderate increase in urinary excretion of nitrogen and diminished the rate of weight gain. No effects were observed on the glucose-tolerance curve, fasting sugar, or serum electrolytes. In one case of macrogenitosomia with Addisonian symptoms, a marked sodium diuresis occurred immediately after the use of cortisone was discontinued, suggesting that this hormone had a salt-retaining effect.

Toxic effects were noted in only one patient, a 2½-year-old infant who became excited while receiving 50 mg. of cortisone daily. The periods of treatment were too short to note definite effects upon the virility of the patients. Long-continued therapeutic trials are indicated to determine whether progressive virilism can be prevented.

FROM THE AUTHORS' SUMMARY.

FEMALE PSEUDOHERMAPHRODITISM IN CONGENITAL INSUFFICIENCY OF THE ADRENALS. A. PRADER, Helvet. paediat. acta **5**:426 (Nov.) 1950.

A case of female pseudohermaphroditism with adrenal cortex insufficiency is described. The condition was diagnosed when the patient was 3 weeks old. In the light of present-day endocrinology the case can be understood as due to a congenital disturbance of adrenal cortex function, with excessive production of N hormone and deficiency in electrolyte hormone. Administration of desoxycorticosterone (doca®) acetate and NaCl relieved the cortical insufficiency, while administration of cortisone brought the excessive excretion of 17-ketosteroids down to nearly normal levels.

FROM THE AUTHOR'S SUMMARY.

LYMPHANGIOMA OF THE THYMUS IN CHILDHOOD. A. PAGANI, Schweiz. med. Wchnschr. **81**:1205 (Dec. 8) 1951.

Upon roentgenographic examination of a 3½-year-old boy a tumor was found in the anterior mediastinum, probably taking its origin from the thymus. An inflammatory or leucemic tumor could be excluded. The slow response to x-ray therapy excluded the possibility of the tumor having a lymphoepithelial or lymphosarcomatous nature. The tumor was punctured, but the reports of two pathologists were contradictory. The final diagnosis was lymphangioma of the thymus.

AMBERG, Rochester, Minn.

GOITER IN CHILDHOOD AS CONSEQUENCE OF FAULTY NUTRITION. ENRIQUE ST. LOUP B., Schweiz. med. Wchnschr. **82**:88 (Jan. 26) 1952.

In a previous publication an enlargement of the thyroid gland was described as "goitre in orphanages." This condition occurs from the age of 4 years on, most frequently between 9 and 14 years. It is more frequent in girls. In the majority of cases the only finding was enlargement

of the thyroid gland, sometimes with evidence of hyperthyroidism but no exophthalmos; evidence of hypothyroidism was rare. In an institution in which the nutrition was very faulty, 51% of the inmates had goiter, in contrast to somewhat more than 7% in schools of children with better nutrition.

AMBERG, Rochester, Minn.

TRANSVERSE AXIAL STRATIGRAPHY IN THE STUDY OF THYMIC HYPERTROPHY. A. DE MEASTRI and C. LOMBROSO, Minerva pediat. **3**:255 (May) 1951.

Transverse axial stratigraphy, in which the x-rays are directed at the lateral plane where the second rib joins the sternum, gives a transverse shadow of the thymus gland. This roentgenogram and an anterior-posterior roentgenogram of the chest afford a means of evaluating the size and shape of the gland.

HIGGINS, Boston.

PREMATURE MAMMARY DEVELOPMENT WITHOUT PRECOCIOUS PUBERTY: A CLINICAL CASE. C. SAINZ DE LOS TERREROS, Acta pediat. españ. **9**:69 (Jan.) 1951.

A case of genuine mammary development, with glandular tissue and not merely fatty accumulation, is presented. Although the breasts gave all signs of puberty, there were no other secondary sexual signs of premature development. The height, weight, and psychic development were that of a 5-year-old child. The hormonal study of the urine was normal; the roentgenogram showed normal skeletal development. However, the sella turcica showed some very slight evidence of hyperpituitarism.

The author feels that very careful use of testicular extract is indicated, since he thinks this condition is due to very early hyperactivity of the pituitary. However, he feels he must be guarded in his prognosis as to the effectiveness of the testicular hormone.

A roentgenogram of the sella turcica and a photograph of the 5-year-old child, normal in every way except for the mammary development, are included.

ALLEN, Santa Fe, N. M.

HEMORRHAGE INTO THE SUPRARENAL CAPSULES IN THE NEWBORN. TEJEDA L. and AHUMADA L., Rev. chilena pediat. **20**:242 (June) 1949.

Five cases of adrenal hemorrhage in newborn infants are reported, including both clinical and pathological aspects. The authors have tried to place each case in Goldzieher's classification, that is, first, cases in which the hemorrhage proper, with its symptomatology of acute anemia, is the major symptom, and second, those cases in which there is a hormonal insufficiency which produces a "pseudopneumonia-like" picture.

As treatment in those cases in which acute anemia is the prime symptom the authors propose liberal use of transfusions and, in exceptional cases, surgical procedures; in the "pseudopneumonia" cases they recommend a hormonal treatment with cortical extract and desoxycorticosterone.

FROM THE AUTHORS' SUMMARY.

DIABETES IN CHILDREN AND ITS TREATMENT. AUGUSTO WINTER E., EUGENIO AMENABAR R., and RAUL MOLINA, Rev. chilena pediat. **21**:440 (Oct.) 1950.

The authors review the case histories of five diabetic children, commenting on the complications and treatment. They recommend the diet instituted by P. White, who calculates the total number of calories, figuring 1,000 calories for the first year with the addition of 100 calories for each year thereafter, divided into 20% proteins, 40% fats, and 40% carbohydrates. The carbohydrates are allotted as follows: one-fifth for breakfast, one-fifth at tea time, one-fifth for supper and two-fifths for lunch.

It is an accepted fact that the initial treatment must be done with ordinary insulin until compensation has been achieved, beginning with 10 units for those under 5 years old, 20 units for those under 10, and 30 units for those over 10, with controls of blood and urine sugars. After this initial treatment, globin insulin or protamine zinc insulin can be used. The importance of studying the patient in a hospital is stressed.

Overdosage with insulin, excessive exercise, or underfeeding may cause a hypoglycemic shock, which can be treated with fruit juices or, in severe cases, with intravenous injection of

dextrose solutions. At the site of the injection one may find adipose tissue atrophy, indurated nodules, or allergic phenomena.

It is essential to teach both parents and child the basic characteristics of the disease. Periodic determination of glycosuria will allow the physician to check the insulin dose. Treatment may be considered satisfactory when the fasting blood sugar is normal and when the dextrose loss is not more than 10% of the amount ingested. There should also be a normal physical and mental development.

Infection, dietetic errors, or lack of treatment lead to diabetic coma. Insulin treatment is begun with 50 to 80 units, followed by 25 to 50 units every one-half hour, to a total of 100 units for an infant and 150 units for a child. During the first 24 hours the patients should receive only fluids by mouth and Hartmann's solution, 60 gm. per kilogram, both orally and parenterally.

The importance of infections is stressed, since they produce an increased need for insulin.

FROM THE AUTHORS' SUMMARY.

ACUTE INFECTIONS: TOXIC ADRENAL HEMORRHAGES (WATERHOUSE-FRIDRICHSEN SYNDROME). WOLFGANG RIEGER, Deutsche med. Wchnschr. **76**:925 (July 20) 1951.

A 10-year-old girl and her 2-year-old brother became seriously ill within a short time. The boy died in about 10 hours. Both adrenal glands showed evidence of destruction and were intensely hemorrhagic. From blood and spleen staphylococci were cultured, probably as a result of contamination. From the blood of the sister hemolytic streptococci were obtained. In her case the hemorrhages in the skin were less intense than in the boy, but a number of her joints were affected. Under treatment with large doses of penicillin, a sulfonamide, and desoxycorticosterone (percoten®) acetate, this patient recovered. The sugar-tolerance test (Staub-Traugott) showed a marked increase after the second dose but became normal two weeks later. This increase and the similarity of the skin lesions with those of the boy are interpreted as indication of adrenal involvement.

AMBERG, Rochester, Minn.

THYMUS DEATH OF NEWBORN AND YOUNG INFANTS. RUDOLF GARSCHE, Med. Klin. **45**:1538 (Dec. 1) 1950.

The author, criticizing a paper by E. Mink, concludes that the designation "thymus death" is only a circumscription of the confession that a real cause of death has not been found. This paper is followed by a final statement by Mink, an obstetrician, who insists upon "thymus death," which means death of a newborn infant due to asphyxia in the presence of an enlarged thymus, without other findings.

AMBERG, Rochester, Minn.

ELECTROENCEPHALOGRAM IN CONGENITAL HYPOTHYREOSIS. M. D'AVIGNON and K. A. MELIN, Acta pædiat. **38**:37, 1949.

Twenty-two patients with clinically determined congenital hypothyreosis were examined, and a follow-up study was done by means of electroencephalography. All the patients except one were adequately treated and normally developed somatically, but their mental development showed a wide range of variation. In general, the psychically normally developed patients had electroencephalograms with normal frequencies, while those who were most poorly developed mentally seemed to show general cerebral damage reflected in pathological electroencephalograms. The time at which this injury arose will be the object of further study.

FROM THE AUTHORS' SUMMARY.

PARENTERAL-FLUID THERAPY IN DIABETIC COMA. ALLAN M. BUTLER, Acta pædiat. **38**:59, 1949.

The extracellular and intracellular losses incident to diabetic coma are presented. Maintenance requirements during the first 24 hours of therapy are estimated. The repair and maintenance needs thus defined by metabolic-balance data and by clinical experience indicate the unphysiologic nature of so-called physiologic saline (isotonic sodium chloride solution) in the parenteral-fluid therapy of diabetic coma.

The total parenteral-fluid therapy needed to repair the losses and to meet the maintenance requirements during rehydration is indicated. The manner of providing the parenteral rehydration is described.

FROM THE AUTHOR'S SUMMARY.

CONGENITAL HYPERPLASIA OF THE ADRENALS WITH ADRENAL CORTEX INSUFFICIENCY. LARS-ERIK CARLGREN, Acta pædiat. **38**:71, 1949.

A short survey is given of a syndrome, described previously but still little known, consisting of congenital hyperplasia of the adrenal glands with adrenal cortex insufficiency, with respect to water and electrolyte hormone and increased production of androgenic hormone. Three new cases are presented.

FROM THE AUTHOR'S SUMMARY.

DIABETES MELLITUS IN EARLY INFANCY, TREATED WITHOUT DIETARY RESTRICTIONS. GEORGE M. GUEST, Acta pædiat. **38**:196, 1949.

Diabetes mellitus occurred in three successive sibling infants, with onset of symptoms at 3 months of age in two and at 9 days of age in the third. The parents are nondiabetic, but there is a history of diabetes in collateral branches of both families. The first infant died 14 hours after treatment with insulin was started, having suffered severe acidosis probably for more than 48 hours before the diabetes was recognized. In the other two, insulin therapy was started immediately when glycosuria was discovered. Both have been fed normal infants' diets, without restriction. The younger was breast-fed for 10 months on a "demand schedule," receiving 1 and 2 units of protamine zinc insulin daily. At 3½ years and 1¾ years of age, respectively, both are receiving approximately 8 units of protamine zinc insulin and 6 units of insulin daily, a dosage that permits continuous mild glycosuria. They have never suffered acidosis, despite several intercurrent infections, and growth has been normal.

FROM THE AUTHOR'S SUMMARY.

SOME PRESENT-DAY PROBLEMS IN CLINICAL DIABETES RESEARCH. BERTIL SÖDERLING, Acta pædiat. **38**:602, 1949.

The author considers the discovery of insulin and the introduction of the free diet the most important practical advances in the treatment of diabetes in children. The free diet not only makes life more enjoyable for the children, but also its effect upon the KH balance, among other things, has presumably revealed the error of many preconceived opinions.

The cause of the disease is still very obscure, in spite of experimental research in cases of extirpation of the pancreas and alloxan diabetes and in spite of promising discoveries by Cori and Cori, Houssay, and others. Diabetic patients with noteworthy insulin sensitivity, even higher than in healthy persons, or patients in whom the need for insulin suddenly becomes greatly reduced are of etiologic interest. Seven cases are described. In many cases diabetes mellitus in children does not appear to be purely an insulin-deficiency disease.

FROM THE AUTHOR'S SUMMARY.

SKELETAL AGE IN DIABETIC CHILDREN. C. A. HERNBERG and P. E. HEIKEL, Acta pædiat. **40**:486 (Nov.) 1951.

The skeletal age was assessed roentgenologically in 35 girls and 46 boys with diabetes mellitus, their ages ranging from 9 months to 15 years. Some acceleration was observed in 16%, retardation in 20%, and normal conditions in 64%. In the majority of the cases the retardation seemed to occur in connection with acidosis. In early childhood the retardation was perhaps due to some endocrinal factors following hepatomegaly. The cause of acceleration was not found, but the relationship between the acceleration and some well-known endocrinal circumstances in diabetic children of the same age is discussed. No definite relationship between the duration of the disease and the abnormal variations was revealed.

FROM THE AUTHORS' SUMMARY.

Diseases of Muscles, Bones, Joints, and Lymph Nodes

CONGENITAL MYASTHENIA IN SIBLINGS. PAUL M. LEVIN, Arch. Neurol. & Psychiat. **62**:745 (Dec.) 1949.

Congenital myasthenia occurring in two siblings is reported. Two of the mother's first cousins had bilateral congenital ptosis. In both cases reported the muscles supplied by the cranial nerves were most severely involved. During both pregnancies the mother noted delayed quickening and less-than-normal fetal activity. It is suggested that this indicates a prenatal inception of the disease.

McGUIGAN, Evanston, Ill.

PROGRESSIVE DIAPHYSEAL DYSPLASIA. JAMES B. GILLESPIE and ROBERT D. MUSSEY, J. Pediat. **38**:55 (Jan.) 1951.

Progressive diaphyseal dysplasia (Engelmann's Disease) has been reported before in only eight cases. It is characterized by progressive symmetrical enlargement and cortical thickening in the diaphyses of the long bones. Clinically, the patients show muscular weakness, failure to gain weight, and, occasionally, neurologic variations.

MACDONALD, Pittsburgh.

TRAUMATIC PERIOSTITIS IN YOUNG CHILDREN. GEORGE H. BARMEYER and LEE R. ALDERSON, J. Pediat. **38**:184 (Feb.) 1951.

The acute limping leg of early childhood, traumatic in origin, is frequently the result of periosteal separation. The child may cry when the leg is palpated and may limp for a week or two. Initial roentgenograms are normal but roentgenograms taken a week to 10 days after injury may show signs of an ossifying periosteal reaction which resolves completely in, perhaps, three or four months. No treatment is necessary.

MACDONALD, Pittsburgh.

VOLUMETRIC AND MICROSCOPIC PATTERN OF BONE MARROW IN NORMAL INFANTS AND CHILDREN: PART I. P. STURGEON, Pediatrics **7**:577 (April) 1951.

The volumetric technic described is technically practical for the study of bone marrow in infants and children. Tibial aspirations show, in general, a progressive increase in fat and a decrease in the myeloid-erythroid layer with advancing age; after approximately 2½ years of age, many of the specimens reflect a relatively fatty and hypoplastic marrow. Iliac aspirations from children 18 months through 11 years of age yield volumetric values comparable to the values obtained from sternal aspirations. Sternal aspirations of children from 5 through 11 years of age yield values similar to those reported in the older age ranges.

With use of the technics described, the iliac site is technically superior to the sternum for the study of bone marrow of children from 18 months through 11 years of age; for those less than 18 months of age, the tibia offers a practical site.

FROM THE AUTHOR'S SUMMARY.

CONGENITAL STIPPLED EPIPHYSES. G. DAVID FORD, MARTIN SCHNEIDER, and JAMES R. BRANDON, Pediatrics **8**:3880 (Sept.) 1951.

Two infants, one full-term and the other premature, presenting findings of congenital stippled epiphyses (chondrodystrophia calcificans congenita, dysplasia epiphysalis punctata) are described. The characteristic feature of the entity is the presence of multiple, discrete, dense, calcific stippling in many cartilaginous epiphyses and apophyses. The diagnosis necessarily rests on roentgenographic examinations. The full-term infants exhibited shortening of the proximal long bones of the extremities and bilateral congenital cataracts. Autopsy studies were made on the premature infant. Histologic features were similar to those previously described, namely, an irregular pattern of bone formation with areas suggesting mucoid degeneration which were most prominent in the vertebral bodies.

FROM THE AUTHORS' SUMMARY.

OSTEOID OSTEOMA IN CHILDHOOD. HOWARD M. PURCELL, STEPHEN D. MILLS, and PAUL R. LIPSCOMB, Pediatrics **9**:295 (March) 1952.

Osteoid-osteoma is a small benign tumor usually of endochondral bone, affecting mainly the long bones of the extremities and occurring not uncommonly among children. It produces pain

which may disturb sleep and interfere with normal activities. The roentgenogram reveals a radiolucent area surrounded by osteosclerosis. This is suggestive of osteoid-osteoma, but differential diagnosis from certain other neoplastic, inflammatory, and metabolic lesions of bone must be made. Thirteen children with osteoid-osteoma have been treated by excision of the lesion at the Mayo Clinic. The results have been uniform alleviation of symptoms. This experience and that obtained elsewhere has shown that incomplete removal of the nidus may lead to recurrence of the symptoms.

FROM THE AUTHORS' SUMMARY.

A STUDY OF ACUTE MONOARTICULAR ARTHRITIS OF INFANTS AND CHILDREN. M. M. KINAWI and A. OMAR, J. Roy. Egyptian M. A. **32**:906 (Nov.-Dec.) 1949.

One hundred sixty cases of monarticular arthritis in children under 5 years old were studied. Primary treatment was plaster immobilization for twice as long as the time needed for the temperature to become normal. Sulfonamides and penicillin were used, but the authors credit the excellent results to the plaster, since results were equally good in patients whose conditions were due to resistant organisms.

McGUIGAN, Evanston, Ill.

FRACTURES OF THE ELBOW IN CHILDREN. ANTERO NOAILLES PEREZ, Acta pediat. espaň. **9**:270 (March) 1951.

Fractures of the superior condyles of the humerus are common in children and are usually called fracture of the elbow. Other fractures in this area are rare, although fracture of the olecranon is fairly frequent. A fracture of the superior condyle is usually caused by a strong blow on the forearm, usually from a fall, and the fracture is transverse. The fragments are held in the displaced position by the triceps muscles. The superior portion is held firm, and the lower portion is pulled backward.

A large hematoma develops in the elbow which limits motion and may even impair circulation. Unless the radial pulse is greatly affected, it is best to wait until the hematoma and swelling go down before manipulation. On the anterior surface palpation may reveal the fragment just above the bend of the elbow, while on the dorsal surface there is a soft area with a depression just above the olecranon. Roentgenograms should be made of all elbow injuries. Occasionally a roentgenogram may fail to reveal a fracture when it is subperiosteal or "green stick," but with the above findings some immobilization should be done, although for a much shorter time. Occasionally a lateral stellate fracture of the condyle into the diaphysis may be found. After the reduction the arm is put in hyperflexion and immobilized.

The soft tissues must be carefully watched, especially the radial artery and the radial and cubital nerves, as these may be caught between fragments. Roentgenograms should be taken in both anterior-posterior and lateral positions. Any nerve or other soft tissue lesions should be treated in the first month, at least.

Reductions should be made only with the patient under general anesthesia. After extension and reduction of fracture, the splint is put on with the elbow at right angle; as the swelling disappears, this is gradually brought to an acute angle or hyperflexion. In a child, this should not all be done at once. The splint should be removed every two or three days until the hematoma has completely disappeared. If the roentgenogram shows the position of the fragments to be satisfactory, the forearm should be put in acute flexion and a splint put on for 24 to 30 days.

The patient is allowed gradual motion after the first month, gradually achieving a right-angle position, but complete extension should not be expected before three months after the accident.

Compound fractures should be treated immediately and radically, since death may occur from certain of these injuries if not cared for immediately. Roentgenograms of elbow fractures before and after treatment are included in the article.

ALLEN, Santa Fe, N. M.

IMPORTANCE OF EARLY DIAGNOSIS OF CONGENITAL DISLOCATION OF THE HIP. J. E. RIVAROLA, Arch. argent. pediat. **36**:39 (July) 1951.

A review of diagnostic criteria is presented, and a plea is made for early routine examination for this anomaly.

PANOS, Galveston, Texas.

CORTICAL HYPEROSTOSIS IN THE CHILD: CASE REPORT. SIMON TISNADO MUNOZ, Rev. peruana pediat. **21**:1 (April-June) 1950.

This report concerns a case of infantile cortical hyperostosis which appears to be the first case observed in Latin America. The patient, a girl 20 days old, had been referred because of painful swelling in the right forearm (and also in the lower right mandibular zone), fever, mild anemia lymphocytosis, and cortical thickening in the right humerus and ulna as shown in serial roentgenograms. A diagnosis of congenital syphilis was entertained, and penicillin treatment was given. Serological, clinical, and roentgenological studies led to the correct diagnosis of infantile cortical hyperostosis (Caffey-Smyth syndrome).

The available literature is reviewed, the differential diagnosis is discussed, and possible causes are suggested.

FROM THE AUTHOR'S SUMMARY.

MYOSITIS OSSIFICANS PROGRESSIVA. S. GROBELNIK, Ann. pædiat. **177**:103 (Aug.) 1951.

The author describes a case of progressive myositis ossificans which started at the age of 9 months. He suggests that Gotto's definition, hyperplasia fascialis ossificans progressiva, should be adopted, since one is dealing not with an inflammatory process but with a metaplastic change of the intermuscular connective tissue into bone. He assumes that the illness is caused by a faulty development of the mesenchyma with additional endocrine disturbances. Therapy was of no avail.

FROM THE AUTHOR'S SUMMARY.

QUESTION OF ENDOCHONDRAL EPIPHYSEAL DYSOSTOSIS. R. SEYSS and E. WEISNER, Helvet. paediat. acta **5**:461 (Nov.) 1950.

A diagnosis of endochondral epiphyseal dysostosis was made in a boy of 8 years because of delay in the appearance of the centers of ossification in the epiphyses and small bones, and because of the strictly symmetrical distribution of the lesions, i. e., so-called microcenters of ossification of irregular outline. No disturbances of metabolism or of the endocrine system were found, and the blood chemistry was normal. Mentally, the boy was normal for his age. The condition is presumably inherited as a recessive character. In this particular case the authors have attributed the onset of the condition to excessive cycling. The diagnostic feature of Marquardt, i. e., an abnormal patella (a condition, which has been considered *sine qua non* in supposed cases of endochondral dysostosis), was present, though the bones mainly affected were those of the foot. In respect to the latter, the case is unique among the published cases of this condition. In the follow-up study of this case, the authors hope to be able to arrive at a conclusion as to whether they are dealing with a forme fruste or an early phase of the disease. The condition has an unfavorable prognosis, and treatment is singularly symptomatic.

FROM THE AUTHORS' SUMMARY.

PATHOGENETIC AND THERAPEUTIC PROBLEMS IN JUVENILE EPIPHYSEAL NECROSIS OF THE HIP JOINT. LEGG-CALVE-PERTHES, Schweiz. med. Wchnschr. **80**:1251 (Nov. 25) 1950.

When signs of irritation of the soft parts have disappeared, drilling of the epiphysis from the region of the trochanter is recommended, at the time when necrosis of the bone becomes manifest upon roentgenologic examination. If this is followed by proper immobilization of the hip joint for two to three months, the period of recovery is shortened by many months.

AMBERG, Rochester, Minn.

KÖHLER'S DISEASE AND THE INSTANTANEOUS FRACTURE OF THE OS NAVICULARE IN CHILDHOOD. JEAN HEER, Schweiz. med. Wchnschr. **81**:731 (July 28) 1951.

A 7½-year-old boy suffered an insignificant lesion of the soft parts of the dorsum of the right foot. Roentgenograms disclosed Köhler's disease of the os naviculare of both feet. Various opinions about the nature of the disease are discussed. It has been described as aseptic necrosis of the bone, persistent fracture or fracture due to fatigue, and insidious fracture of injury due

to overload. The primary lesion is a fracture; the necrosis is secondary. Nearly always microfractures are found. It is of interest that the basal metabolic rate was + 47% in this case.

AMBERG, Rochester, Minn.

ACTION OF CHOLIN ON THE CREATIN BODIES IN PROGRESSIVE MUSCULAR ATROPHY. E. SCHWARZ-TIENE, Ann. ital. pediat. **4**:259 (Aug). 1951.

Observations on two cases of progressive muscular dystrophy show that impairment of the metabolism of the creatine bodies is secondary to the functional-morphological change of the muscular fiber, a factor in the lowering of utilization of creatine and in its transformation into creatinine.

Prolonged treatment with choline is followed by improved metabolism of choline and improved muscular function. The favorable effect of the choline in progressive muscular dystrophy can be explained as due to a larger amount of acetylcholine in the motor end-plates or the stimulating effect of the choline on the fat and protein metabolism. An improved synthesis of myosin occurs directly and indirectly through the reduced fatty infiltration of the muscular fibers.

FROM THE AUTHOR'S SUMMARY.

SACRO-COCCYGIAL TERATOMA. GIACOMO ACETO, Arch. ital. pediat. e puericolt. **14**:388 (No. 5) 1951.

The author describes a case of congenital malformation consisting in a monstrous mass of the sacrococcygeal region in a newborn girl. Study of the case was completed histologically. The final diagnosis was ectomesodermic teratoma.

FROM THE AUTHOR'S SUMMARY.

EARLY PRIMARY FIBROSARCOMA IN THE ABDOMINAL WALL MUSCLE OF A CHILD OF 2 YEARS. R. CARTA, Clin. pediat. **33**:647 (Oct.) 1951.

An encapsulated fibrosarcoma was removed surgically from the right lower rectus abdominis muscle of a child of 2 years. There had been no signs of recurrence four years later.

HIGGINS, Boston.

A RARE LOCALIZATION OF OSTEOMYELITIS PARATYPHOSA IN INFANCY. H. ERBIG, Kinderärztl. Praxis **18**:338 (July-Aug.) 1950.

A case of osteomyelitis of the proximal end of the humerus affecting the proximal epiphyseal center is reported in a 7-month-old infant. Culture of material obtained by articular puncture revealed Salmonelli paratyphi B (Schottmüller). The agglutination titer was 1:12,800. Feces and urine showed no bacilli. No clinical evidence of a preceding paratyphoid infection was found.

GLASER, Jerusalem, Israel.

DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF EWING'S SARCOMA. H. STADLER, Med. Klin. **44**:1634 (Dec. 23) 1949.

In connection with the disease observed in a 7-year-old girl, first with the diagnosis of osteomyelitis and finally with the diagnosis of Ewing's tumor, the difficulties of diagnosis, even with histological examination, are discussed. In the differential diagnosis the age of the patient may be of help, since the majority of patients are between 4 and 25 years old, while myeloma, for instance, is rare in childhood. Aspiration of tissue helps in the differentiation of tumor tissue from other lesions.

AMBERG, Rochester, Minn.

WHY EARLIEST TREATMENT OF CONGENITAL CLUBFOOT. WOLFRAM ELSNER, Med. Klin. **46**:1275 (Nov. 30) 1951.

Reasons are given for manipulative treatment of congenital clubfoot during the first days of life. The manipulation and after-treatment are described.

AMBERG, Rochester, Minn.

MALIGNANT LYMPHOGRANULOMA IN CHILDHOOD. MUDR JIKI JANELE, Pediat. listy **5**:269, 1950.

Seventeen cases of proved malignant lymphogranuloma (Hodgkin's disease) in children are described. The frequency in boys was not quite double that in girls; the average age of onset was 5½ years, the youngest being 2 years old; the average age on first admission was 7½ years. The duration varied from two and one-half months to 10 years. Enlargement of the cervical glands was the most common first sign. Only in the minority of cases was the temperature normal; in 12 cases the typical Pel-Epstein temperature curve was observed. The blood picture did not show any typical changes, except perhaps for the lowering of the lymphocyte-monocyte index which was found to be the most reliable sign. Typical Sternberg-Reed cells were seen in one of five bone-marrow smears and in two of three gland-puncture smears. In only two cases could the condition be described as Hodgkin's paragranuloma, and there were no cases of the sarcomatous form of the disease. The number of cases is too small to allow a comparison between the effects of deep x-ray therapy and chloralamine chemotherapy.

FROM THE AUTHOR'S SUMMARY.

X-RAY APPEARANCE OF THE KNEE JOINT IN OBESE OVERGROWN CHILDREN. HANS-OLOF MOSSBERG, Acta pædiat. **38**:509, 1949.

The skeleton in obese children is said by Czerny and Keller to be abnormally well developed. However, the over-all early development of obese children has not been taken into consideration. By comparison with statistically treated data on normal children, the author shows that the knee skeleton of obese children corresponds well with their early over-all bodily development. Therefore there is no reason to emphasize the marked skeletal development of large fat children as something deserving attention.

FROM THE AUTHOR'S SUMMARY.

OVERACUTE OSTEOMYELITIS. D. VERVAT, Maandschr. kindergeneesk. **19**:154 (July) 1951.

Description is given of two cases of acute osteomyelitis, in which, notwithstanding treatment with penicillin in sufficient dosage, serious complications developed (pseudarthrosis and spontaneous fracture of the affected bone). Both patients had to be treated with transplantation of bone fragments.

FROM THE AUTHOR'S SUMMARY.

Diseases of Eye

WHY THE INCREASE OF ALLERGIC DISEASES? LUIGI TARGON, Riv. clin. med. **47**:516, 1948.

Allergic disturbances are now found with greater frequency because of better diagnosis, increase in irritating causes, such as street traffic (gasoline vapor, chimney and engine smoke), more variable foods, and, perhaps, a change in the central and vegetative nervous system of civilized man. The author emphasizes the avoidance of nose and throat operations when cytologic examination shows an allergic process.

SANFORD, Chicago.

MILIARY ANEURYSMS OF THE RETINAL VESSELS. MAGDA RADNÓT, Paediat. danub. **6**:143 (Sept.) 1949.

A case is reported of a 12-year-old boy who presented, besides atrophy of the optic nerve and bitemporal hemianopsia, miliary aneurysms of the retinal vessels of the right eye. The picture remained unchanged for one and one-half years. The aneurysms are interpreted as developmental anomalies, while the other symptoms were found at operation to have been caused by a cavernous hemangioma situated before the sella. It is concluded that in conditions arising in consequence of developmental anomalies of the vessels simultaneously affecting the brain and eyes, a hitherto undescribed change, miliary aneurysms of the retinal vessels, may be associated with basal hemangiomas.

FROM THE AUTHOR'S SUMMARY.

UNILATERAL NYSTAGMUS IN INFANCY. BERTIL LINDQUIST, Acta pædiat. **38**:440, 1949.

In agreement with earlier opinions, the author considers that unilateral nystagmus may occur in diseases of very different types. A report is given of one case of unilateral nystagmus without manifestation of any ocular or cerebral defects, two cases of unilateral nystagmus in conjunction with diseases of the central nervous system, and one case of unilateral nystagmus in a patient with toxoplasmosis and retinochoroiditis. Various theories concerning the causal factors of nystagmus are discussed.

FROM THE AUTHOR'S SUMMARY.

Cutaneous Diseases; Allergy

STUDIES IN BACTERIAL ALLERGY: III. RESULTS OF 3,860 CUTANEOUS TESTS WITH 34 CRUDE POLYSACCHARIDE AND NUCLEOPROTEIN FRACTIONS OF 14 DIFFERENT BACTERIA. OSCAR SWINEFORD JR. and JAMES HOLMAN, J. Allergy **20**:420 (Nov.) 1949.

As a result of 3,860 cutaneous tests with crude polysaccharide and nucleoprotein fractions of 14 kinds of bacteria, the authors make the following observations. 1. "It cannot be concluded that intracutaneous reactions to bacterial fractions have lessened the problems of the etiological diagnosis or treatment of bacterial allergy. Too many links are missing." 2. "The term 'bacterial allergy' should not be used to designate solely the delayed tuberculin type of hypersensitivity. Bacterial allergy manifests itself in the skin at least in both immediate and delayed reactions." 3. "Diagnostic procedures other than skin tests are needed to establish etiological relationship between bacteria and syndromes of clinical allergy."

HOYER, Cincinnati.

SOME OBSERVATIONS ON THE USE OF ADRENOCORTICOTROPIC HORMONE IN ATOPIC DERMATITIS IN INFANCY. ANGELO DIGEORGE and WALDO E. NELSON, J. Pediat. **38**:164 (Feb.) 1951.

Corticotropin (ACTH) is valuable in producing remissions in generalized atopic eczema. The authors suggest that corticotropin should be used in these cases only as a temporary adjunct to therapy, during periods of unusual stress.

MACDONALD, Pittsburgh.

THE EFFECT OF ALLERGIC MANAGEMENT ON GROWTH AND DEVELOPMENT OF ALLERGIC CHILDREN. JOHN B. WELSH, J. Pediat. **38**:571 (April) 1951.

It has been reported that growth failure is more common in allergic children than in normal controls. Using the Wetzel grid as an index, Welsh followed the growth records of 34 allergic children for periods of 12 to 100 months. Apparently most or all of these children had respiratory symptoms. All were under allergic control during the time studied. Only 2 of the 34 children showed signs of growth failure.

MACDONALD, Pittsburgh.

PENICILLIN SENSITIVITY SIMULATING ATOPIC DERMATITIS. SHELDON G. COHEN, J. Pediat. **38**:741 (June) 1951.

To the previously reported skin manifestations of penicillin sensitivity is added this case in which, following administration of penicillin, the clinical picture of atopic dermatitis appeared in a nonatopic child.

MACDONALD, Pittsburgh.

MICROSPOROSIS OF THE SCALP: EVALUATION OF A NEW THERAPEUTIC AGENT. BERNARD APPEL, MAURAY J. TYE, WILLIAM HALPERN, and DOMENICA PACI, New England J. Med. **245**:1003 (Dec. 27) 1951.

The authors treated 61 children with tinea capitis with asterol® dihydrochloride, using both a 2% water-soluble ointment and a 2% tincture. There was no evidence of primary irritation or sensitivity, and the tincture seemed more effective, in general.

Thirty-one children were treated for less than three months and were hence dropped from the series. Thirty children were treated for over three months with the following results:

Five of six patients with Microsporum lanosum (canis) infection were cured; five of twenty-four patients with Microsporum audouini infection were cured. The conclusion drawn from these results was that the drug merited further investigation, perhaps in a higher concentration.

WHEELOCK, Denver.

A RARE CASE OF ALLERGIC PURPURA. C. CHOREMIS, N. ZERVOS, and MLLE KIZA, Helvet. paediat. acta **6**:160 (April) 1951.

A rare form of anaphylactic purpura is described. The outstanding feature of this particular form was large hemorrhagic blisters which appeared in crops, the first outbreak occurring at the age of 8 years and the second outbreak four years later. This second attack was aggravated by intestinal colic and hemorrhagic stools.

FROM THE AUTHORS' SUMMARY.

ALLERGIC REACTIONS FOLLOWING THERAPY WITH PENICILLIN AND STREPTOMYCIN. R. SCHUPPLI, Schweiz. med. Wchnschr. **81**:589 (June 23) 1951.

Various forms of allergic manifestations following treatment with penicillin or streptomycin are described. It seems that the sensitization develops in about 10 days and is not related to the dosage. Subcutaneous injections in places of pyoderma, as well as aerosol inhalation, produce the effect. Penicillin should be avoided in patients who respond in a few days to simple remedies. Particular care is to be exercised in cases of mycoses.

AMBERG, Rochester, Minn.

GEOGRAPHIC TONGUE. S. SANTYAN Y VELASCO, Lattante **23**:28 (Jan.) 1952.

Of about 3,000 babies examined 61 had geographic tongues. Examination of the parents of these babies revealed in several instances an abnormal appearance of the tongue. The opinion is expressed that geographic tongue has a hereditary and familial basis. Geographic tongue often clears up fairly well following polyvitamin therapy, but vitamin PP alone, in the author's experience, was of no value in this condition.

HIGGINS, Boston.

NEW CASES OF ECTODERMOSIS PLURIORIFICIALES OF FEISSINGER RENDU (STEVENS-JOHNSON SYNDROME). JERÓNIMO POU DIAZ, Acta pediat. españ. **7**:1241 (Oct.) 1949.

The author, Chief of the Provincial Health Service, Department of Infant Hygiene, Seville, reports two cases of Stevens-Johnson syndrome. This disease has been described under a number of names, and confusion has resulted. By careful reporting and description the author believes that this could be cleared up.

Diaz believes the disease to be a clinical entity, although not nosologically an entity. It belongs to a large group of aphthous diseases classified by Newman and Touraine. The author prefers not to use the term erosive, since many of the lesions are not erosive. Some writers consider it a variety of erythema multiforme exudatum and call it Stevens-Johnson syndrome because it was described by those investigators in 1922. It was described as a new erythematous fever with stomatitis and ophthalmia. Diaz rejects the name of mucorespiratory syndrome because other systems are affected, including the nervous system.

The condition is not frequent but neither is it very rare, and since 1922 70-odd cases have been described by Ritter, Ginsburg, and Berger in America. In Spain the author and Rodriguez Morina have described a number of cases. Other authors have described a similar condition in adults.

ALLEN, Santa Fe, N. M.

INFANTILE ACRODYNIA. IGNACIO DIAZ BOBELLO, ENRIQUE L. LOPEZ, and JOSE M. RICCIARDONE, Arch. argent. pediat. **35**:21 (Jan.-Feb.) 1951.

This is a review of the subject and a presentation of the cases of three patients, 10, 21, and 24 months old, respectively. The various etiologic factors are reviewed and the authors state that most of the available evidence indicates that this is an infectious disease. Mercury poisoning is mentioned, but the rather detailed case reports contain no mention of an attempt to rule it out.

PANOS, Galveston, Texas.

A Case of Generalized Dermatitis Bullosa from Sulphathiazole. Pedro Daniel Martinez and Luis Gomez Orozco, Bol. méd. Hosp. inf., México **7**:879 (Dec.) 1950.

Report is made of a case of generalized bullous dermatosis caused by sulfathiazole. At the beginning the rash was morbilliform; later it turned vesicular, bullous, and exfoliative. Due to its evolution, there were some diagnostic confusions at the different stages; but the evolution itself discarded all infectious processes with skin manifestations, and later it was possible to confirm the correct diagnosis, leaving the drug as the causative agent.

From the Authors' Summary.

Koilonychia After Severe Chronic Disorder of Nutrition in Childhood. E. Weisner, Wien. klin. Wchnschr. **63**:407 (June 1) 1951.

At the age of 3 months an infant was admitted to the hospital with severe atrophy. Under treatment the child improved, and upon dismissal no abnormalities of the nails were seen. At the age of 14 months the child was seen again after an attack of measles, and was in very good condition. The nails of the second and third fingers, however, presented a dish-like concavity. Their consistency was strikingly soft. Both big toes showed an indication of the same abnormality. No abnormalities of the nails were found in other members of the family.

Amberg, Rochester, Minn.

Pathogenesis of Infantile Eczema. J. Lukes, M. Prochazkova, and B. Rejsek, Pediatristy **7**:15 (Jan.) 1952.

The atopic terrain and the external contact factors were investigated in 20 infants with eczema. The results of the investigation of the atopic terrain were in agreement with those of earlier authors. The investigations of contact factors showed the importance of skin pyococci and other allergens with which the infant comes into contact.

From the Authors' Summary.

Dermatomyositis in Children. Hans Sunde, Acta pædiat. **37**:287 (No. 3-4) 1949.

In two instances children with dermatomyositis showed the more important symptoms, with an acute remittent course in one case and a chronic course in the other. Nothing definite can be said about the origin, but attention is called to Streptococcus infection. Strikingly many cases appear to show increased antistreptolysin titers. The author discusses whether dermatomyositis may be looked upon as secondary to certain infectious diseases, possibly as a state of hypersensitivity of the skin and muscles to some circulating antigen or bacterial product. The treatment is symptomatic. Protection against infections during the course of the disease is important.

From the Author's Summary.

Kaposi's Varicelliform Eruptions. Ingvar Alm, Acta pædiat. **38**:23, 1949.

An account is given of the symptomatology and therapy in five cases of Kaposi's varicelliform eruptions in infants between the ages of 5 and 9 months. In one case bacteriologic and serologic studies showed the presence of staphylococci, and resistance determinations showed that these bacteria were sensitive only to streptomycin. The patient rapidly became afebrile, and there was considerable improvement in his condition after administration of this drug.

From the Author's Summary.

Acrodynia and Mercury Poisoning. S. van Creveld and M. M. P. Paulssen, Acta pædiat. **38**:82, 1949.

This article describes an atypical case of acrodynia which was apparently caused by the use of mild mercurous chloride (calomel). During treatment with dimercaprol (BAL), the symptoms disappeared very quickly, and after a temporary increase the enlarged excretion of mercury soon diminished.

From the Authors' Summary.

OVERSENSITIVE REACTIONS TO MERCURY (CALOMEL DISEASE AND ACRODYNIA). G. FANCONI, Acta pædiat. **38**:147, 1949.

Mercury, even in therapeutic doses, frequently causes allergic reactions, particularly in infants. About 8 to 10 days after mercury has been used there appears an acute exanthematous reaction, so-called calomel disease. After weeks or months acrodynia and more rarely polyradiculitis or a nephrotic syndrome may occur. The acrodynia may be considered a neuro-allergic reaction, in which, according to the Zurich school, the mercury usually acts as an allergen (hapten). This is supported by a positive reaction of the skin to mercury, shown by Bloch's lip test, in patients with acrodynia, and also by an appreciable amount of mercury in the urine.

FROM THE AUTHOR'S SUMMARY.

ANTIHISTAMINE ACTION IN HUMAN SKIN. PAUL KALLOS and LISELOTTE KALLOS-DEFFNER, Acta pædiat. **38**:351, 1949.

The resorption rate of intracutaneously injected fluorescein sodium is distinctly increased in the area of histamine and urticarial (allergic) skin reactions. The permeability of the capillaries in both of these types of wheals is markedly increased. This increase of permeability was, under certain quantitative circumstances, reduced or inhibited by a potent antihistaminic drug, antistine.® The estimation of the resorption rate of fluorescein sodium gives values which make a quantitative evaluation of the effectivity of antihistaminic drugs possible.

FROM THE AUTHORS' SUMMARY.

DERMATITIS HERPETIFORMIS IN CHILDREN: REPORT OF 3 CASES. Y. LARSSON and K. HÖÖK, Acta pædiat. **38**:413, 1949.

Three cases of dermatitis herpetiformis in children are described. The first case, that of a newborn child, is remarkable, since the disease is very rare in the neonatal period. All the cases were typical, with a symmetrical multiform eruption, a chronic course without affection of the general condition, and marked long-standing eosinophilia of the blood.

FROM THE AUTHORS' SUMMARY.

SOME OBSERVATIONS ON ERYTHEMA NODOSUM. RUSTIN MCINTOSH, Acta pædiat. **38**:454, 1949.

Erythema nodosum is seen less frequently in the United States than in the Scandinavian countries. In 16 years 43 cases have been observed in children less than 13 years of age in the Babies' Hospital, New York, an incidence of about 1 case in 1,200 admissions. The majority of patients tested showed skin sensitivity to Streptococcus pyogenes, although only a small fraction of the patients were actually rheumatic or subsequently manifested rheumatic fever; a minority of the total group had positive reactions to tuberculin. On the basis of a limited experience, the hypothesis is advanced that erythema nodosum, when it is causally related to tuberculosis, is associated with the efflorescence of the primary infection, and that cases which appear months after the initial tuberculous infection, or second attacks developing in tuberculin-positive children, represent the expression of hypersensitivity to some other allergen, often a beta-hemolytic streptococcus. In any given case of erythema nodosum, before one accepts the relationship of the eruption to tuberculosis on the basis of a positive tuberculin reaction alone, it is desirable that a search be made for hypersensitivity to other antigens.

The frequency of occurrence of erythema nodosum among inhabitants of the Scandinavian countries does not lead to its more frequent appearance in American descendants of Scandinavian stock, as one might expect if susceptibility were genetically transmitted as a constitutional trait.

FROM THE AUTHOR'S SUMMARY.

AUREOMYCIN TREATMENT OF HERPES ZOSTER AND CHICKENPOX. GUSTAF LINDBERG, Svenska läk-tidning. **47**:813 (April 6) 1950.

Two cases of chickenpox and two cases of herpes zoster are reported all of which healed remarkably rapidly with aureomycin treatment. The author recommends aureomycin therapy only in severe complicated cases.

WALLGREN, Stockholm, Sweden.

HEMISCLERODERMA ALTERNANS. ROLF ZETTERSTRÖM, Acta pædiat. **38**:657, 1949.

A report is given of a case of hemiscleroderma alternans with atrophy of the skeleton and musculature in a 4-year-old girl. The disease had its onset one year earlier in connection with symptoms resembling encephalitis. In view of the course of the disease and the symptomatology, an infectious origin appears probable. An injury localized to the pons varolii area could have caused the autonomic-trophic disturbances with atrophy and sclerosis.

FROM THE AUTHOR'S SUMMARY.

ACRODYNIA. WILHELM BLYSTAD, Tidsskr. norske lægefor. **68**:639 (Dec. 1) 1948.

Report is made of four typical cases of acrodynia observed within one week at the University Clinic, Oslo. Previously there has been only one case diagnosed in Norway, in 1938.

WALLGREN, Stockholm, Sweden.

SCABIES CRUSTOSA (S. NORWEGICA) ASSOCIATED WITH HEPATOSPLENOMEGALY. B. LOLAND, Tidsskr. norske laegefor. **70**:123 (Feb. 15) 1950.

A 9-year-old boy of a family with endemic scabies had apparently suffered from the disease since early infancy. The skin on the whole body surface was involved, and the efflorescences contained mites. There was a deteriorated general condition and marked anemia with eosinophilia (30%). At 5 years of age hepatosplenomegaly was found. After treatment the eosinophilia disappeared, the liver became normal, and the spleen was only slightly enlarged.

WALLGREN, Stockholm, Sweden.

INFANTILE ACRODYNIA. ERLING ESP, Tidsskr. norske laegefor. **70**:266 (April 15) 1950.

A typical case of erythredema neuropathy (acrodynia) in a 2-year-old boy is described. This is the third case reported from Norway.

WALLGREN, Stockholm, Sweden.

GENERAL REACTIONS PRODUCED BY BACTERIAL VACCINES IN ASTHMATIC CHILDREN. E. WINGE FLENSBORG, Ugesk. læger **112**:392 (March 23) 1950.

The author has treated asthmatic children by vaccines containing ordinary pathogenous bacteria from the upper respiratory tract. In 26% a general reaction occurred at an average of two days after injection, lasting from six hours to six days. In 15% the reaction occurred with the first injection. The author recommends that bacterial vaccines be used with great care in treatment of asthma in children, especially in children who have already displayed a previous slight reaction. He reports the death of a one-year-old infant which was related to the sixth injection of the vaccine; the infant had had fever and asthmatic reaction to the five previous injections of the vaccine (doses in the six injections: 13,000,000; 26,000,000; 1,300,000; 1,300; 2,600, and 2,600 bacteria respectively).

WALLGREN, Stockholm, Sweden.

ACRODYNIA AFTER INTAKE OF MERCURY. BOY KROMANN, Ugesk. læger **112**:925 (June 29) 1950.

A girl of 6 years showed symptoms and signs of erythredema neuropathy (acrodynia) after repeated intake of mild mercurous chloride (calomel). Mercury was demonstrated in her urine, and the amount increased during dimercaprol (BAL) treatment which was followed by evident improvement of the erythredema neuropathy.

WALLGREN, Stockholm, Sweden.

ECZEMA IN INFANTS AND CHILDREN: ITS TREATMENT. M. K. POLANO, Maandschr. kindergeneesk. **18**:268 (No. 7) 1950.

It is important to distinguish three classes of infantile eczema; contact eczema, seborrheic eczema, and atopic eczema. The first must be treated by removal of the irritant and by bland external therapy. Contrary to some current opinions, neither seborrheic eczema nor atopic eczema are caused by ingested foods. The most effective treatment as yet in both cases is

systematic dermatological external treatment, which is different for each type. In atopic eczema arsenic compound and sedatives may be used as adjuvants of the external treatment. Some rules for the external treatment of infantile eczema are given.

FROM THE AUTHOR'S SUMMARY.

FAMILIAL CONGENITAL NEUROECTODERMAL DYSPLASIA. W. H. H. TEGELAERS, Maandschr. kindergeneesk. **18**:376 (No. 10) 1950.

A description is given of familial congenital neuroectodermal dysplasia, total alopecia, and palmar and plantar hyperkeratosis, in combination with disorders of the central nervous system, in four of five children of one family.

VAN CREVELD, Amsterdam, Netherlands.

ECZEMA IN CHILDHOOD. J. R. PRAKKEN, Nederl. tijdschr. geneesk. **94**:3212 (Nov. 11) 1950.

A description is given of different kinds of eczema in childhood. The allergic origin of eczema is discussed. Skin tests for allergy are unreliable. The results of dietary therapy are disappointing. Secondary infection is frequent under poor hygienic circumstances. Sometimes eczema is secondary to a staphylococcic infection of the skin. Treatment of the infection may result in clearing of the eczema.

VAN CREVELD, Amsterdam, Netherlands.

Surgery and Orthopedics

SURGICAL CORRECTION OF BOW-LEG DEFORMITY IN A YOUNG ADULT. ROBERT F. WARREN, Brooklyn Hosp. J. **9**:153, 1951.

Correction of marked bowleg deformity in a 16-year-old girl was accomplished by excision of the proximal ends of both fibulae and high osteotomy of the tibiae.

MCGUIGAN, Evanston, Ill.

FRACTURES ABOUT THE ELBOW IN CHILDREN. FRANCIS J. COX, MELVIN T. HURLEY, and RICHARD B. COMPTON, California Med. **76**:13 (Jan.) 1952.

Any fracture about the elbow joint of a child is a serious problem. A real possibility of growth disturbance with resulting disability is always present. Every poor result in the series reported here was associated with some interference with growth. To avoid poor results, anatomical restoration of alignment and reapposition of fragments is imperative.

The authors report clinical experiences in the treatment of 135 cases of fractures of the elbow region in children, of which 60 cases have been followed to an end-result. A detailed mode of treatment of supracondylar fractures, fractures of the medial epicondyle, and fractures of the lateral condyle and capitellum is discussed. The pitfalls in treatment and causes of poor results are detailed.

PRYOR, Redwood City, Calif.

TREATMENT OF MILD KNOCK KNEES AND PRONATED FEET IN CHILDHOOD. GUY A. CALDWELL, R. L. SHORKEY, and T. L. DUNCAN, New Orleans M. & S. J. **104**:304 (Feb.) 1952.

Sixty-three children with knock knees, bowlegs, and pronated feet were treated with simple shoe wedges. Excellent results were obtained in 77%. The authors consider the deformity to be physiological in most cases and describe the physiological basis of the condition. Pronation of the feet is the most important factor influencing final results, and treatment by wedging the shoes is described.

MCGUIGAN, Evanston, Ill.

WRY-NECK FACIAL DISTORTION PREVENTED BY RESECTION OF FIBROSED STERNOMASTOID MUSCLE IN INFANCY AND CHILDHOOD. JAMES BARRETT BROWN and FRANK MCDOWELL, Ann. Surg. **131**:721 (May) 1950.

The deformity of congenital wryneck may be prevented by early excision of the sternomastoid muscle that has been replaced by scar tissue, and this may be the only operation that is adequate in severe lesions. The operation of excision preferably should be done before deformity

becomes permanent, with its distortion of the facial bones. Therefore it is best done in young babies. Only a few days in the hospital are required, and no special postoperative care is necessary.

Movements of the head in all directions in these babies are normal just after operation and remain so. The slant-wise deformity of the face begins improving as soon as the pull is removed from the mastoid in younger children. The uncorrected, or partially corrected, lesion is productive of such gross deformity and marked facial asymmetry that it seems worth while to rely only upon measures which are definitive and adequate enough to relieve it completely.

BANTIN, Omaha.

FRACTURES OF THE ELBOW IN CHILDREN. WALTER P. BLOUNT, IRWIN SCHULZ, and ROBERT H. CASSIDY, J. A. M. A. **146**:699 (June 23) 1951.

Bone growth must be considered in treating fractures of the elbow in children. Over two-thirds can be treated without operation. The treatment of various fractures is discussed.

KIMBALL, Evanston, Ill.

PISTOL-SHOT WOUND OF THE HEAD IN A CHILD. LEONARDO VALLETTI, Arch. ital. pediat. puericolt. **14**:380 (No. 5) 1951.

Description is given of a case of pistol-shot wound (7.5 caliber) in a 4-year-old child. The ball, entering the skull through the right frontal bone with an oblique trend, fractured the internal and external walls of the left parietal bone; it rebounded in the corresponding occipital fossa and came to rest in the cerebral cortex 1 cm. from the meninges. The child survived and was successfully operated upon, although with some delay. The ball was removed, and three foci of cerebral abscesses were surgically cleansed and treated with antibiotics. An examination made a year later showed an almost complete recovery of speech and of the right upper leg movements, while the lower leg still showed a limp. An evident insufficiency of the right facial nerve while laughing was also observed.

FROM THE AUTHOR'S SUMMARY.

Teeth and Dentistry

A CHART ON ERUPTION OF THE DECIDUOUS TEETH FOR THE PEDIATRICIAN'S OFFICE. HOWARD V. MEREDITH, J. Pediat. **38**:482 (April) 1951.

Meredith presents data on the time of eruption of the deciduous teeth in North American children. In 90% of children, all 20 teeth erupt within the age span of 18 to 30 months.

MACDONALD, Pittsburgh.

DENTAL HEALTH SERVICE AS A FUNCTION OF PREVENTIVE PEDIATRIC CARE. WALTER C. PRICE, P. A. SCIULLO, and VIRGINIA STILLEY, J. Pediat. **39**:206 (Aug.) 1951.

The authors describe in detail a program for dental health service in the outpatient department of a children's hospital.

MACDONALD, Pittsburgh.

PROPHYLAXIS AGAINST DENTAL CARIES IN CHILDREN. B. ROCCIA, Minerva pediat. **3**:191 (April) 1951.

In northern Italy, 80 to 90% of children 3 to 12 years old have dental caries. In many of these children there is involvement of the permanent teeth. Prenatal nutrition, as well as postnatal care, is necessary for good teeth. Prevention of infectious and toxic diseases, proper food, good mouth hygiene, and periodic visits to a dentist will contribute to sound teeth in children.

HIGGINS, Boston.

SODIUM CHLORIDE WITH FLUOR AS CARIES PREVENTIVE. JULIUS CSERNYEI, Schweiz. med. Wchnschr. **80**:1291 (Dec. 2) 1950.

It is claimed that caries of the teeth proceeds from the pulp or the lymph of the tooth and that phosphoric acid liberated by phosphatase is of importance. This activity of the phosphatase is

dependent as the relationship of calcium fluoride to magnesium, and is accelerated when the normal relationship is disturbed. In a healthy human tooth the relation of calcium fluoride to magnesium is 1:6, in that of the caries-immune tooth of the horse 1:3, while in a carious human tooth it may be 1:28. The neural influence on caries is discussed.

AMBERG, Rochester, Minn.

Miscellaneous

CHLOROMYCETIN. M. CONNILL SANTIAS, Arch. Pediat. **1**:115 (July) 1950.

This is a discussion of the history of the isolation of chloramphenicol (chloromycetin®), its physical and chemical properties, the experiments in animals, and a review of its uses clinically. The drug filled a much-needed lack in the treatment of diseases caused by Gram-negative bacteria and in the treatment of the Rickettsial diseases. The author reviews the work of Payne with typhus, Smadel and Woodward in tsutsugamushi disease, and Pitcoffs in Rocky Mountain spotted fever. The use of chloramphenicol in psittacosis, granuloma inguinale, Malta fever (brucellosis), typhoid and urinary infections due to Escherichia coli is also discussed. Dosages and details of treatment are included.

ALLEN, San Francisco.

MALIGNANT TUMORS OF CHILDHOOD. RALPH E. KNUTTI, California Med. **76**:27 (Jan.) 1952.

In the past 20 years, cancer in the age group 0 to 14 years has become the second leading cause of death by disease. At some ages, notably between 5 and 14 years, it may be the leading cause of death by disease. Leukemia is the most frequent form of cancer in childhood, and tumors of the brain are in second place.

An attempt should be made to categorize more accurately tumors stated in reports as "miscellaneous," since in the reports analyzed herein, 15.8% of all malignant lesions were so classified.

PRYOR, Redwood City, Calif.

AUREOMYCIN IN PEDIATRICS: A REVIEW. H. SHWACHMAN, G. E. FOLEY, and C. D. COOK, J. Pediat. **38**:91 (Jan.) 1951.

Because of its wide range of activity, aureomycin is one of the most generally useful antibiotics. The authors have reviewed the history of the development of this agent and its pharmacology. Aureomycin is apparently effective in the treatment of primary atypical pneumonia, staphylococcic infections, herpes zoster, acute renal infections and rickettsias. It is also effective in pneumococcic and streptococcic infections, especially when other antibiotics have failed. Results have been equivocal with acute respiratory infections, brucellosis, pertussis, and Hemophilus influenzae infection. Chloramphenicol is more effective in Salmonella infections.

MACDONALD, Pittsburgh.

CURRENT ADOPTION PRACTICES. CATHERINE S. AMATRUDA and JOSEPH V. BALDWIN, J. Pediat. **38**:208 (Feb.) 1951.

No matter how you look at it, adoption is a gamble, both for the child and for the foster parents. In practice three safeguards should be used. The foster home should be assessed by a person qualified in such work, the child should be appraised by a doctor and a psychologist, and there should be a probationary period in which the child and the home may be observed together. After this, specific recommendations concerning the advisability of the adoption can be made. Unfortunately, it is seldom possible to adhere to these rules. All in all, adoption agencies are more successful than independent placements.

MACDONALD, Pittsburgh.

NEUROBLASTOMA SYMPATHETICUM WITH METASTASES: REPORT OF A CASE WITH APPARENT RECOVERY. DAVID GOLDRING, J. Pediat. **38**:231 (Feb.) 1951.

A child with neuroblastoma, with definite metastatic lesions in the liver and probable metastases in the skeletal system, was treated with small doses of x-rays. Two years after discovery of the tumor, the child is alive and has no apparent sign of the disease.

MACDONALD, Pittsburgh.

LOCAL HEMORRHAGIC-NECROTIC SKIN REACTION FOLLOWING PENICILLIN. ELI RUBENS, J. Pediat. **38**:630 (May) 1951.

An infant had a necrosis and slough of an area on the right buttock following an injection of penicillin procaine in peanut oil with aluminum monostearate. A previous injection of the same mixture had been given six weeks before. The reactions to skin tests with peanut oil and aluminum monostearate and with procaine were negative. Tests with penicillin resulted in small areas of erythema without pseudopods. The author suggests that this case may be an example of the Shwartzman phenomenon.

MACDONALD, Pittsburgh.

FERROUS SULFATE TOXICITY. ROBERT P. SMITH, CHARLES W. JONES, and WINSTON E. COCHRAN, New England J. Med. **243**:641 (Oct. 26) 1950.

The authors present a case of accidental fatal iron-sulfate poisoning which occurred in a 17-month-old child who ingested and absorbed approximately 75 grains of the drug. The clinical manifestations included gastroenteric irritation, vasomotor collapse, methemoglobinemia, hemorrhagic phenomenon, and signs of renal and pancreatic damage.

Treatment at home should consist of prompt emetic measures plus introduction into the stomach of a protein source, such as egg or milk. Hospital treatment includes administration of oxygen, methylene blue, demulcents by mouth (aluminum hydroxide gel and bismuth sulfate), whole blood transfusion, and epinephrine.

The patient's course in the hospital, the autopsy report, and speculations and facts concerning the mechanism of action of toxic amounts of iron sulfate are presented. It is suggested that parents be warned against promiscuous handling of this ubiquitous drug.

WHEELOCK, Denver.

LABORATORY ASPECTS OF ANTIBIOTIC THERAPY. EARLE H. SPAULDING, Pediatrics **8**:406 (Sept.) 1951.

For a year or two after the introduction of penicillin many clinicians believed that culture studies were no longer needed; as a result the number of specimens submitted to the laboratory declined sharply. But the appearance of streptomycin reversed this trend, and the subsequent discoveries of chloramphenicol, aureomycin, and terramycin have created a need for culture study which greatly exceeds the level existing before the days of penicillin.

Prior to the advent of antibiotics the primary function of the infectious-disease laboratory was to isolate and identify the causative organism. At the present time, however, its principal contribution is the determination of in vitro susceptibility to antibiotics.

Bacterial strains within a single species exhibit highly specific susceptibility patterns when tested with the several antibiotics currently available. Because in vitro susceptibility tests constitute the only certain method for predicting clinical response, the bacteriology laboratory is playing an expanding part in the choice and control of antibiotic therapy. Although there is no need for bacteriologic studies in the vast majority of infections, they are sometimes essential to the successful management of severe acute, refractory, and relapsing infections. The correlation between laboratory and clinical results is very good providing allowances are made for certain factors discussed in this paper. Antibiotic-susceptibility tests are entirely practical and should be used routinely in all laboratories which do bacterial cultures.

FROM THE AUTHOR'S SUMMARY.

THE INFLUENCE OF GLUTAMIC ACID ON TEST PERFORMANCE. D. G. ELLSON, PAUL R. FULLER, and ROBERT URMSTOM, Science **112**:248 (Sept. 1) 1950.

The authors studied a group of 60 children who ranged in age from 9 to 17 years and in I. Q. from 16 to 70. Thirty subjects were given glutamic acid in daily doses of 30 gm. for a period of nine months, whereas a group of 30 controls were given placebos. A battery of tests were given at the start, in the middle, and at the end of the experimental periods. These tests included measurements of both intellectual and motor performance. The authors conclude that the experimental group showed a slightly greater gain in I. Q. and motor performance than the

control group, but that the differences were not significant. The only significant differences between the gains made by the two groups were found in the coordination tests, in which the control group showed a greater gain than the experimental group.

FORBES, Dallas, Texas.

THE DETERMINATION OF CHOLINESTERASE ACTIVITY IN THE WHOLE BRAINS OF DEVELOPING RATS. CHARLES J. METZLER and DOUGLAS G. HUMM, Science **113**:382 (April 6) 1951.

Determinations of cholinesterase activity were made in a series of rats ranging in age from the 14-day fetus to the adult. No activity was found in the 14-day fetus, the activity first appeared in the 16-day fetus. There was no increase in activity, however, until the second postnatal day, after which a rapid increase in the concentration of the enzyme was observed. Thereafter, cholinesterase activity declined as growth proceeded to an adult level, which is roughly twice that of the newborn animal.

FORBES, Dallas, Texas.

ACCIDENTS IN CHILDREN. C. COLLINS-WILLIAMS, Canad. M. A. J. **65**:531 (Dec.) 1951.

Since the reduction of childhood mortality by better methods of diagnosis and treatment of disease, accidents have risen to first place as a cause of death in children past infancy. Twenty-one per cent of deaths in children between 2 and 14 years old are the result of accidents. The reduction of these fatalities is the responsibility of the physician, who must educate parents and children to eliminate or avoid causes of accidents.

MCGUIGAN, Evanston, Ill.

THE PHYSIOLOGICAL AND CLINICAL EFFECTS OF CORTISONE AND THE ADRENOCORTICOTROPHIC HORMONE. L. S. P. DAVIDSON, Edinburgh M. J. **57**:317 (Aug.) 1950.

Davidson has outlined the developmental backgrounds of cortisone and corticotropin (ACTH), as well as their phenomenal clinical applications. As he says, we do not know why these hormones act as they do. Until we learn more about their mode of action and until we learn how to control their undesirable side-effects, they must be used with great caution.

MACDONALD, Pittsburgh.

CLINICAL TRIALS OF ACTH. J. J. R. DUTHIE, Edinburgh M. J. **57**:341 (Aug.) 1950.

The author confirms some of the early clinical and biochemical observations on corticotropin (ACTH). Except when the adrenal cortex is exhausted, a rise in capillary resistance follows the administration of corticotropin. Tests of capillary resistance may be valuable in screening new substances with cortisone-like activity.

MACDONALD, Pittsburgh.

RECENT ADVANCES IN PEDIATRICS. ERIC B. SIMS, Clin. Rep. Adelaide Child. Hosp. **2**:65 (May) 1951.

The most outstanding advances in the field of pediatrics are summarized and discussed. The paper is admirable, but does not lend itself to abstracting.

MCGUIGAN, Evanston, Ill.

RECENT ADVANCES IN PEDIATRICS. MORRIS MEDALIE, South African M. J. **25**:757 (Oct. 20) 1951.

This article is essentially a brief discussion of current practices and research being done in various pediatric centers in eastern United States.

MCGUIGAN, Evanston, Ill.

PENICILLIN DOSAGE IN INFANCY AND CHILDHOOD. R. SAKR, A. ELIAN, and M. A. GOHAR, J. Roy. Egyptian M. A. **34**:541 (No. 8) 1951.

The authors, after extensive experimental work, have found that an average dose of 5,000 units of penicillin per pound (0.5 kg.) per 24 hours gives adequate serum levels in children up to 12 years of age.

MCGUIGAN, Evanston, Ill.

AEROSOL PENICILLIN THERAPY FOR INFANTS AND CHILDREN. P. KARLBERG, G. STERNER, and G. WALLMARK, Ann. pædiat. **175**:263 (Sept.) 1950.

An account is given of experiences with a simple apparatus for aerosol inhalation in infants and small children. The absorption of penicillin by this method has been studied in 30 children, aged from 1 month to 2½ years, by serial determinations of the penicillin concentration in the serum. The determinations have been carried out by a slightly modified form of Fleming and Smith's micromethod.

In order to obtain a comparison with parenteral administration of penicillin, serum determinations have been made on 20 of 30 children after an intramuscular injection of 5,000 to 10,000 I. U. of penicillin.

After 10 minutes' inhalation of penicillin aerosol (50,000 I. U.) the penicillin level in the blood is about the same as after an intramuscular injection. No complications have been observed from the treatment, either during or after therapy, and it seems to be well tolerated by the infants. A dose of 50,000 I. U. seems to be the most suitable for children from birth up to 2 to 3 years of age, independent of body weight. A modified plastic mask to be used for older children is described. Clinical experience with the method has been very good. The indications for aerosol therapy are discussed.

FROM THE AUTHORS' SUMMARY.

A CASE OF INTOXICATION FROM PETROL. JACQUELINE BACH and J. CAEN, Ann. pædiat. **177**:20 (July) 1951.

Report is made of a case of benzine poisoning followed by pneumonia which proved to be resistant to the usual antibiotics and in which there was relapse on the 18th day. The pathogenesis of the lung process is discussed and cases from the literature cited.

FROM THE AUTHORS' SUMMARY.

TREATMENT OF ASPIRATION OF PETROLEUM WITH CORTISONE. E. NASSAU, Ann. pædiat. **178**:181 (March) 1952.

The atelectasis found after drinking and aspirating paraffin is due not only to an obstruction in the bronchial tree by the aspirated fluid. The changes in the lungs come after a bronchospasm. That this concept is correct is supported by the effect of a single injection of cortisone which terminates the bronchospasm and thus removes the danger of collapse and anoxemia at once. At the same time it prevents the development of atelectases in the lungs.

FROM THE AUTHOR'S SUMMARY.

A NEW CASE OF PROGERIA (HUTCHINSON-GUILFORD-SYNDROME). E. ROSSI, Helvet. paediat. acta **6**:165 (April) 1951.

A new classic case of progeria is described. At present only 20 cases have appeared in the literature, as far as the author is aware. The case conforms to the full classic picture in all respects: dwarfism, hydrocephalus, exophthalmos, absence of the chin, pronounced venous markings on the skull, greatly diminished subcutaneous fatty layer (panniculus adiposus), and, most striking of all, the characteristic (old-man) facial expression and posture, i. e., the slightly flexed limbs (horse-riding stance).

FROM THE AUTHOR'S SUMMARY.

CLINICAL CONTRIBUTION TO THE STUDY OF NERVOUS AND CIRCULATORY PHENOMENA SECONDARY TO THE ACTION OF CHLOROMYCETIN IN INFANTS. GIUSEPPE MACCIOTTA, Ann. ital. pediat. **4**:383 (Oct.) 1951.

A baby, 4 years, 6 months old, affected with a typhoid infection, which was confirmed by serum examination, was treated with chloramphenicol (chloromycetin®) in doses adequate for his age and weight. As a result of this treatment the enteric condition became worse but a reduction in temperature took place. On the fifth day of treatment a sudden manifestation of a cardiovascular collapse with symptoms of myocarditis was noticed; a remarkable hemolysis and encephalosis followed. As these symptoms became progressively worse, the baby died on the 10th day of sickness.

The author supposes that chloramphenicol may have been the cause of the phenomena and ascribes much importance to the insufficiency of liver function due to an inadequate production of glucuronic acid which usually binds with protective effect 80% of the antibiotic eliminated by urine.

FROM THE AUTHOR'S SUMMARY.

HANDLING OF ILLEGITIMACY IN THE PROVINCE OF FERRARA OVER A 10-YEAR PERIOD. M. ORTOLANI, Lattante **22**:285 (May) 1951.

In Ferrara the early recognition of illegitimate children was found to have moral and economic benefits and to contribute to the solution of a difficult social problem.

HIGGINS, Boston.

ITALIAN PEDIATRIC ARTICLES IN 1950. PRESTI-SEMINERIO, Lattante **22**:609 (Oct.) 1951.

This annual listing covers 550 papers in Italian journals published in 1950. The articles are grouped under subject headings. A short sentence outlines the contents of each article.

HIGGINS, Boston.

AEROSOL THERAPY. G. DELLEPANE AND OTHERS, Minerva pediat. **1**:346 (Oct.) 1949.

Minerva pediatrica devotes the whole October, 1949, number to reporting the proceedings of the June 12th session of the Piedmont Section of the Societa italiana di pediatria. This meeting was devoted to the subject of aerosol therapy. Many short reports are given, covering various drugs (antibiotics, antihistamine preparations, ephedrine, insulin, estrogen, etc.), various diseases (respiratory infections, asthma, pertussis, nasal and laryngeal congestion, diabetes, laryngeal papillomata), and the various means of administration (by nose, by mouth, by tracheotomy tube, by respiratory chamber, and by instilling the mist through the entire room).

HIGGINS, Boston.

CLINICAL EXPERIMENTAL STUDIES ON SALICYLATE THERAPY IN CHILDREN. P. MENGHI and G. MONTAGNOLO, Minerva pediat. **1**:425 (Dec.) 1949.

Curves were plotted showing the salicylate content of the blood at hourly intervals after sodium salicylate had been administered to sick and to well children by mouth, by rectum, and intramuscularly. Maximum values were reached at the second hour after oral administration, at the third and fifth hours after rectal administration, and at the half-hour after intravenous administration. Fifteen grams of sodium salicylate per kilogram of body weight per day will ordinarily maintain a salicylate serum concentration of 35 to 45 mg. per 100 cc., a well-tolerated level.

HIGGINS, Boston.

APPPLICATIONS OF TRANSVERSE AXIAL STRATIGRAPHY IN PEDIATRICS. E. DE TONI, Minerva pediat. **3**:247 (May) 1951.

A description is given of the technique of transverse axial stratigraphy (tomography) as developed by Vallebona of the University of Genoa. By this method, the x-ray tube is directed from an oblique angle at the transverse plane of the body of which a roentgenogram is desired. The film is placed in a plane parallel to the selected transverse body planes. With the emission of the x-rays, the film and the patient's body are rotated at the same time and speed. The resulting picture shows clear shadows at the selected body plane and only blurred shadows of tissues in other planes. This method differs from the usual technique in body section roentgenography, in which the rotation is of the x-ray tube and the film.

Transverse axial stratigraphy has been used in studying the organs of the thorax and in pyelography in children. The entire May number of *Minerva pediatrica* is devoted to the clinical application of stratigraphy in children. It is expected that a succeeding number may also be given over to the same subject.

HIGGINS, Boston.

ACUTE ANILINE POISONING IN CHILDREN. L. PARENZAN and G. ZARBIN, Minerva pediat. **3**:393 (July) 1951.

In three children, 1½, 2½, and 3 years old, marked cyanosis and some asthenia and headache developed after their shoes were polished with a preparation containing aniline ("nero d'inferno"). Treatment was by clyses with isotonic sodium chloride solution and dextrose. Recovery was complete in a few hours.

HIGGINS, Boston.

PHARMACOLOGY AND NEPIOLOGY. G. M. PICCININI, Nipiologia **35**:3 (Jan.) 1949.

Piccinini questions the suitability of the time-honored formulae for determining the dosages of opiates for infants up to the age of 3 years. He suggests that the dose of morphine hydrochloride should be 0.1 mg. for the 1-month-old child, 0.5 mg. for the 3-month-old child, 0.75 mg. for the 6-month-old child, 1 to 2 mg. for the child 1 to 2 years old, and 3 mg. for the 3-year-old child. For children up to the age of 3 years, the recommended dosage of a sulfonamide drug is 0.2 gm. per kilogram of body weight per day.

Marmalades, treated by sulfites in the manufacture, are a not-uncommon item in the diet of children 1 to 3 years old. Assurance is given that the amount of sulfite present is insufficient to be harmful to children.

HIGGINS, Boston.

THE ACTION OF PARA-AMINOBENZOIC ACID IN ANAPHYLACTIC AND HISTAMINIC ACETYLCHOLINIC SHOCK IN GUINEA PIGS. GINO BROGI and MARIO VERROTTI, Riv. clin. pediat. **48**:701 (Nov.) 1950.

The authors were able to prove that paraaminobenzoic acid protects a very high percentage of guinea pigs from serum shock, while it does not possess such protective effect against histaminic acetylcholinic shock in guinea pigs.

FROM THE AUTHORS' SUMMARY.

THREE CASES OF FAVISM IN THE PROVINCE OF SIENA. MARIO VERROTTI, Riv. clin. pediat. **48**:707 (Nov.) 1950.

The author describes three cases of favism in the province of Siena. Study of the medulla of one of the three patients is emphasized particularly, and some aspects of the pathogenetic problem are examined.

FROM THE AUTHOR'S SUMMARY.

BACTERIOSTATIC ACTION OF VIOMYCIN AND OF VIOMYCIN-STREPTOMYCIN ON KOCH'S BACILLUS. ALVARO MASI and PIERO MOGGI, Riv. clin. pediat. **49**:517 (July) 1951.

Viomycin is active in vitro against both streptomycin-sensitive and streptomycin-resistant strains of Mycobacterium tuberculosis in concentrations of 2 to 8 γ per cubic centimeter. When it is used with other tuberculostatic agents a synergistic effect may be obtained. Subinhibitory concentrations of viomycin, in fact, significantly reduce the necessary inhibitory concentrations of streptomycin and terramycin.

FROM THE AUTHORS' SUMMARY.

RESUMÉ OF RESULTS OF USE OF ANTIBIOTICS IN PEDIATRICS. ANTONIO GALDO, Acta pediat. españ. **9**:67 (June) 1951.

This is a rather complete résumé of the uses of antibiotics in the treatment of childhood diseases. The greatest improvements in mortality rates have been in various forms of pneumonia and other respiratory infections and in dysentery and other gastrointestinal infections. The author outlines the uses of specific antibiotics in tuberculosis, syphilis in the newborn, meningitis, typhoid, whooping cough, rickettsial diseases, and virus infections and the use of penicillin in the prevention of recurrences in acute rheumatic fever.

ALLEN, San Francisco.

KEROSENE POISONING IN CHILDREN. RUDECINDO GALLARDO and MARIO MASS, Rev. chilena pediat. **20**:282 (July) 1949.

During a period of two and one-half years the authors have seen, in the first-aid ward of the Roberto del Rio Hospital, 106 children between the ages of 7 months and 5 years who have accidentally swallowed kerosene or benzine. In their experience this is the most common cause of intoxication.

According to the severity of the symptoms they classify their material into three groups as follows: (*a*) slight acute intoxications, 88 cases; (*b*) intoxication plus a pneumonia-like picture, 14 cases; (*c*) severe intoxication, 4 cases, with two deaths.

A review of the symptoms and complications in the three groups is made. The present knowledge of the pathogenesis and pathology of this condition is summarized.

The treatment used has been gastric lavage and cardiorespiratory analeptics in all instances. In severe cases hypertonic dextrose solutions have been given intravenously. In most cases a secondary infection has been prevented by the use of sulfonamides or penicillin.

No difference was established between the toxicity of kerosene as compared to benzine.

FROM THE AUTHORS' SUMMARY.

ARACHNOIDISM. ALFREDO U. RAMON GUERRA, VICTOR SCOLPINI, and GERMAN SURRACO, Arch. pediat. Uruguay **22**:369 (May) 1951.

A 5-year-old child was admitted to the hospital 18 hours after having been bitten by an unidentified spider, presenting, among other symptoms, an acute hemolytic condition. When he was treated by exchange transfusion, the severe anemia improved, but he died as a result of the other components of the picture of severe arachnoidism, severe anemia being only one of them. The authors emphasize the importance of arachnoidism in their milieu and the necessity of employing an antitoxic specific therapy.

FROM THE AUTHORS' SUMMARY.

SUICIDE ATTEMPT OF AN 11-YEAR-OLD BOY. PAUL HABERMANN, Arch. Kinderh. **139**:130 (No. 3) 1950.

This unsuccessful attempt at suicide, by turning on the gas, is remarkable in various respects. There were endogenous factors, resulting in psychopathic constitution. Environmental conditions were poor. The attempt failed, since this boy calculated in advance how his attempt would be discovered early enough to save him.

GOTTSTEIN, Chicago.

THERAPEUTIC ACTIVITY OF SALICYLAMID. OTTO WIELAND, Med. Klin. **44**:1530 (Dec. 2) 1949.

Salicylamid is the amide of salicylic acid. It can be administered to adults in doses of 8 to 10 gm. daily or for a protracted period of time in doses of 3 gm. daily. The drug is tolerated well and proved of advantage in some cases of acute and chronic polyarthritis.

AMBERG, Rochester, Minn.

EFFECT OF HANDEDNESS IN IDENTICAL TWINS. KARL HUTTER, Med. Klin. **46**:503 (April 20) 1951.

The author discusses left-handedness in identical twins and the results of efforts to correct it. Anatomical asymmetry due to handedness and its consequences are given, as well as peculiarities of the right and left face in right- and left-handed persons. Note is made of a set of identical twins with bodily and mental equality who could not be distinguished by dogs. Bodily differences are more rarely noted than mental ones. Greater clarity of this short paper would be desirable.

AMBERG, Rochester, Minn

ULTRASOUND THERAPY IN PEDIATRICS. E. BISHOP, Kinderärztl. Praxis **18**:562 (No. 11-12) 1950.

Ultrasound waves, produced electrically, were applied by gentle massage to acute and chronically inflamed areas in 256 patients. The author reports rapid improvement of the inflammatory processes and no damaging effect of this form of therapy.

GLASER, Jerusalem, Israel.

VALUE OF AUREOMYCIN AND CHLOROMYCETIN IN PEDIATRICS. E. MARTISCHNIG, Wien. klin. Wchnschr. **63**:947 (Dec. 14) 1951.

Aureomycin and chloramphenicol (chloromycetin®) proved efficacious in the treatment of pertussis. Seventy-one children with severe enteritis or intoxication were treated with aureomycin or chloramphenicol or both. Of these, seven died. The deaths occurred in very young infants or in infants with complications.

AMBERG, Rochester, Minn.

INTOXICATION WITH LEAD IN EARLY CHILDHOOD. M. ROSSLER, Pediat. listy **6**:146, 1951.

Three cases are described of lead poisoning in infants aged 6, 15, and 33 months, respectively, and a review of the literature is given.

In Czechoslovakia, in contradistinction to other countries, plumbism in infants has not been diagnosed yet, although the possibility of poisoning might occur in any place. The question arises whether this possibility has not been overlooked so far in the diagnoses of conditions following encephalitis and polyneuritis of unknown origin.

GRULEE, Evanston, Ill.

BODY FAT AND DIABETES. GUNNAR DAHLBERG, Acta pædiat. **38**:91, 1949.

Available figures concerning the incidence of diabetes and the mortality in this disease do not give any idea as to whether diabetes might be caused by an increased consumption of fat, nor is it possible to draw any conclusion from scanty information obtained in experimental investigation. From a theoretical point of view the most probable supposition is that patients in whom diabetes develops gradually gain weight at an earlier stage of the disease, before the symptoms of diabetes have appeared. It is therefore possible that subjects who in adult life start to gain weight without any alterations in their mode of living will later manifest symptoms of diabetes.

FROM THE AUTHOR'S SUMMARY.

SALICYLATE POISONING IN CHILDREN. E. GORTER, Acta pædiat. **38**:170, 1949.

Prescription of salicylate for the treatment of various diseases in children must be controlled by regular determination of the salicylate level of the blood. This level must be kept between 30 and 35 mg. per 100 cc. In most cases this result is obtained by prescribing 125 mg. of salicylate per kilogram of body weight. Administration of bicarbonate has a favorable action only on the mucosa of the stomach, but it necessitates prescription of larger doses of salicylate. In cases of severe salicylate intoxication treatment consists in combating the acidosis which is always found. In addition treatment of shock and dehydration are sometimes necessary.

FROM THE AUTHOR'S SUMMARY.

SIGNIFICANCE OF DEPTH OF INSERTION OF THE THERMOMETER FOR RECORDING RECTAL TEMPERATURES. P. KARLBERG, Acta pædiat. **38**:359, 1949.

The most suitable depth of measurement for the determination of rectal temperature, and the limits within which it may be allowed to vary, have been determined by thermoelectric methods, the determinations having been made at centimeter intervals from the sphincter edge to a depth of 10 to 15 cm. Children aged from birth to 15 years, as well as some adults, were examined. The requisite depth for reaching a constant temperature decreases with the age of the child; in general, a constant temperature is obtained for all ages at a depth of about 5 cm., with the greatest accuracy in the older ones. Thermometers in current use are constructed for measurement at a depth of 3 cm. The consequences of this are discussed.

FROM THE AUTHOR'S SUMMARY.

SEDIMENTATION RATE IN NURSING MOTHERS. FRITZ KARLSTRÖM, Acta pædiat. **38**:367, 1949.

The sedimentation rate of 168 healthy nursing mothers was taken 528 times during different phases of the nursing period. Immediately after delivery it was considerably elevated. Thereafter it sank rapidly during the first month, then sank more slowly, but did not reach the upper limits of normal until after four months.

During the second, third, and fourth months after delivery the sedimentation rate of mothers of premature children is probably higher than that of mothers of full-term children. No definite difference has been established between the sedimentation rate in mothers who breast feed their children entirely and those who give them supplementary formula feedings.

FROM THE AUTHOR'S SUMMARY.

NUTRITIONAL DEFICIENCIES, DISEASES, AND POOR SOCIAL CONDITIONS DURING PREGNANCY AS THE CAUSE OF NEONATAL MORTALITY AND ILLNESS DURING THE FIRST YEAR OF LIFE. CURT GYLLENSWÄRD, Acta pædiat. **40**:285 (July) 1951.

Whereas the rate of infant mortality has decreased significantly during the past years, the rate of neonatal mortality has remained approximately the same. This is particularly apparent in the statistics of those countries with low infant-mortality rates. In Sweden, for example, the mortality rate for the first week of life may be as high as that for the remainder of the entire first year. It is the author's opinion that it should be possible to prevent a considerable proportion of these neonatal deaths.

The rates of neonatal mortality and of stillbirths, the two being closely associated, are higher among the children of mothers in the lower social groups. This suggests that the social condition of the mother during pregnancy is important in the development of a viable fetus. The incidence of prematurity also is higher in the lower social groups, the importance of this being apparent from the fact that up to 50% of infant mortality may be attributed to prematurity.

The author considers two of the most important tasks of those interested in child welfare today to be those of preventing stillbirths and of decreasing the incidence of prematurity, and he feels that both social and medical measures can be used to advantage in those tasks.

Considerable interest has recently been focused on the possible roles in fetal malformation of certain factors present during pregnancy. Many factors, some positive and some negative, present during pregnancy and/or infancy and possibly causing death or illness during the first year of life are discussed and illustrated.

FROM THE AUTHOR'S SUMMARY.

CEPHALIN-CHOLESTEROL FLOCCULATION TEST IN CHILDREN. A. AFENTAKI, Acta Soc. pediat. hellen. **3**:225, 1949.

Cephalin-cholesterol flocculation tests were performed with the serum of 100 children suffering from various diseases. Reactions were positive in all conditions known to affect the liver cells, such as infective hepatitis, and negative in other conditions not affecting liver function. Of particular interest were the findings in patients with malaria, leishmaniasis, and hereditary leptocytosis (Mediterranean anemia). The reactions were positive (3+ or 4+) in all 9 cases of leishmaniasis and in 9 of 11 cases of malaria.

Of 10 patients with hereditary leptocytosis the reaction was positive in 4, and only at times when the patients had subclinical icterus.

DOXIADIS, Sheffield, England.

A CASE OF ACUTE POISONING FROM A LOCAL ANESTHETIC. IDA J. VAN DIJK, Maandschr. kindergeneesk. **18**:281 (Jan.) 1950.

A description is given of a case of acute intoxication from cocaine. The precautions that have to be taken when using cocaine and its derivatives are mentioned.

FROM THE AUTHOR'S SUMMARY.

A STUDY ON THE ANTIGENICITY AND TOXICITY OF EQUINE SERUM DENATURED BY FORMALIN AND HEAT. SAMUEL H. ZIA, CHUNG-MING LIN, and CH'ANG-TS'AI CHI, Chinese M. J. **67**:317 (June) 1949.

The purpose of this study was to evaluate deantigenated and nontoxic equine serum with a view to its possible use as a substitute for human blood plasma. The conclusion was that horse serum denatured by formalin and heat has no acute toxicity for white mice, guinea pigs, rabbits, and dogs. The authors could not sensitize pigs and dogs to the serum.

MACDONALD, Pittsburgh.

News and Comment

GENERAL NEWS

Specialists Certified by American Board of Pediatrics, Inc.—The following physicians were certified as specialists by the American Board of Pediatrics, Inc., after examinations held at San Francisco, June 27, 28, and 29, 1952.

Baecker, Marvin Philip, Long Beach, Calif.
Ball, James Ira, Jr., Palo Alto, Calif.
Bierman, Charles Warren, Tacoma, Wash.
Bray, Patrick Francis, Jr., Salt Lake City.
Brown, Albert A., Los Angeles.
Carr, John Howard, San Rafael, Calif.
Carroll, Herbert B., Seattle.
Child, Stanley Roberts, Salt Lake City.
Coleman, Harold S., Los Angeles.
Conrad, John P., Jr., Fresno, Calif.
Crehan, Elmer Leo, Los Angeles.
Dana, George Winchester, Portland, Ore.
DeKruif, Alice D., Oakland, Calif.
DeVito, Alfred Thomas, Moscow, Idaho.
Dicken, Dorothy M., Santa Cruz, Calif.
Dittmann, Barbara Edith, Berkeley, Calif.
Donaghe, Roy Wallace, Lawton, Okla.
Dowell, Margaret, Salem, Ore.
Ely, Robert Stewart, Salt Lake City.
Fisher, Ralph M., San Carlos, Calif.
Friend, William K., Santa Ana, Calif.
Goorman, Jean R., Los Angeles.
Greig, Jack Leland, Berkeley, Calif.
Gross, Ruth T., San Francisco.
Grossman, Moses, San Francisco.
Gudbrandsson, Bjorn, Washington, D. C.
Harris, Francis Marion, Jr., Capt. (MC), A. U. S.
Hartenstein, Hans, Lt., (MC), A. U. S.
Haumeder, Robert R., Walnut Creek, Calif.
Henderson, Oliver Morton, Vallejo, Calif.
Herzon, Herbert, Pittsburg, Calif.
Hodes, Abram, San Bernardino, Calif.
Jennison, Maurice Harry, Lt. (jg) (MC), U. S. N. R., Oceanside, Calif.
Jensen, Adrian Richard, Waukegan, Ill.
Kaufman, Harry, Studio City, Calif.
Kelley, Vincent Charles, Salt Lake City.
Kempe, C. Henry, San Francisco.
Kennedy, Walter James, Jr., Yakima, Wash.
Kirchhoff, Clyde August, Ventura, Calif.
Klitsner, Irving Neil, Los Angeles.
Krempels, Geza Joseph, Long Beach, Calif.
Lambert, Tempe Chester, Palo Alto, Calif.
Lawler, Harry James, Billings, Mont.
Lembert, Glenn E., Vancouver, Wash.
Levy, Bertha Marion, Oklahoma City.
McMain, William A., Jr., Salt Lake City.
Miller, Lewis Richard, Redwood City, Calif.
Mitchell, John Roy, Ancon, Canal Zone.
Montgomery, Theodore Ashton, Los Angeles.
Moss, Edward Mitchell, Lt. (MC), U. S. N. R., San Diego, Calif.
Mulloy, Mary, Los Angeles.
Nelson, Thomas Lothian, Eldridge, Calif.
Palmer, Robert Hall, San Mateo, Calif.
Peat, Alexander Cranston, Major (MC), A. U. S.
Plumb, Hugh J., Jr., Corona del Mar, Calif.
Pulido, Venustiano, Studio City, Calif.
Reuben, Ronald, Los Angeles.
Rice, Don Brooks, Klamath Falls, Ore.
Robinson, William Taylor, Woodland, Calif.
Schafer, William Boulware, Montrose, Calif.
Schwartz, Marvyn Sherman, Fresno, Calif.
Shaffer, Harry Daniel, Colorado Springs, Colo.
Smith, Robin, Neenah, Wis.
Stool, Joseph A., Houston, Texas.
Sturgeon, Phillip, Los Angeles.
Sutherland, Donald Arthur, Seattle.
Sutow, Wataru Walter, Capt. (MC), A. U. S.
Tepper, Warren Roswell, Salt Lake City.
Thomas, Lloyd Allen, Capt. (MC), A. U. S.
Tolins, Peter S., San Diego, Calif.
Tucker, James Louis, Seattle.
Tyson, Robert Glenn, Vallejo, Calif.
Vracin, Daniel John, Downey, Calif.
Whittinghill, John A., Billings, Mont.
Wood, John W., San Francisco.
Woodcock, Herbert M., Spokane, Wash.

PERSONAL

Appointment for Dr. Heyworth N. Sanford.—Dr. Heyworth N. Sanford has been appointed Professor and Head of the Department of Pediatrics, University of Illinois, College of Medicine.

Appointment for Dr. Clifford G. Grulee, Jr.—Tulane University of Louisiana School of Medicine, New Orleans, announces that Dr. Clifford G. Grulee Jr. has been made Associate Professor of Pediatrics as well as Assistant Dean and Professor of Graduate Medicine.

ANNOUNCEMENT

Postgraduate Course in Pediatrics.—Dr. Brett Ratner, professor of clinical pediatrics, will direct a postgraduate course in Pediatric Allergy at New York Medical College, Flower and Fifth Avenue Hospitals, 106th and Fifth Sts., New York 29, from Nov. 5, 1952, to May 31, 1953. There will be 30 sessions, from 9 a. m. to 4 p. m. on Wednesdays. The fee is $300.

Books

Somatic and Psychiatric Treatment of Asthma. Edited by Harold A. Abramson, M.D. Price, $11. Pp. 751, with numerous illustrations and tables. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

This is a worth-while and an unusual book. It is worth-while because it contains a great deal of valuable information; it is unusual because it consists of 35 sections, written by 34 different men. The subject of asthma has become so complicated and presents so many different facets that no one man can now be an expert on every phase of it. A book such as this, while it is bound to be uneven in content, gains greatly in that each subject is presented by an expert on that particular subject.

The contributions range from an extremely practical and well-written chapter on the "Office Treatment of Bronchial Asthma," by Rogers, to a complicated and exhaustive discussion of "The Chemical Nature of the Dust Allergen," by Rimington. There is an excellent chapter on "The Physiology of Respiration," by Hoff and Breckenridge, and a most complete chapter, of 44 pages, on aerosol therapy, by Abramson. Sixty-seven pages are devoted to the psychiatric aspects of asthma, by several authors, and many case reports are given which show beyond question the importance of this aspect of asthma. Infection of the respiratory tract, however, is discussed very briefly and inadequately; a whole section should have been devoted to it.

This may well be called a brilliant book. It is recommended highly for allergists; it is not recommended for general practitioners and pediatricians—there are others which better serve their purposes.

Handbook of Medical Management. Edition 2. By Milton Chatton, M.D.; Sheldon Margen, M.D., and Henry D. Brainerd, M.D. Price, $3. Pp. 507. University Medical Publishers, Box 761, Palo Alto, Calif., 1951.

This handbook contains a wealth of information in a minimum of space. The authors have compiled in this second edition a large amount of data, which should be useful to a busy practitioner as a pocket or desk reference. Since this volume is called a handbook, one must not be too critical of its brevity, and yet certain disadvantages must be emphasized. It does not seem wise, to this reviewer, to attempt an outline of treatment for deep-seated psychoneuroses or depressions in a book of this nature. In the chapter on dietetics and nutrition, a table of diets is presented for the treatment of various diseases, and, as an example, a diet containing 300 mg. of sodium is advocated for the treatment of hypertension. Nothing is said regarding the difficulties encountered in following such a diet, and it is conceivable that such advice may be ill-advised for the unwary or uninformed practitioner. In discussing the treatment of infectious hepatitis, it is stated that bed rest should be "maintained until there is no longer clinical or laboratory evidence of the disease." It would seem wiser to discuss more completely the details of laboratory control in a disease in which bed rest is such an important part of the treatment.

Because of the brevity of the volume, this book does not seem adequate for the needs of the medical student. It could be a great aid to the general practitioner provided the reader is able to evaluate carefully the various forms of therapy under discussion.

Human Growth: The Story of How Life Begins and Goes On. By Lester F. Beck, and M. Robbinson. Price, $2. Pp. 124, with numerous illustrations. Harcourt, Brace and Company, Inc., 383 Madison Ave., New York 17, 1949.

Written as a companion book to the, now well-known, Oregon film on sex education of the same name, "Human Growth" is a well-illustrated, 124 page book on the "facts of life."

It is written in a candid and straightforward manner. The text is carefully edited and shows evidence of pretesting to produce the correct psychological impact on readers.

There are but four chapters in the book. Each chapter is followed by what are purported to be representative questions and answers from teen-age youths. In the reviewer's opinion, these

questions and answers are much more naïve and simple than are ordinarily encountered in the field of sex education, formal or informal, with teen-agers.

The four chapters deal with (1) normal growth and development, (2) the role of glands in the regulation of body processes, (3) the fertilization and maturation of the ovum, and (4) the birth process.

A sound attempt to create a proper sense of what is "normal" with respect to the above functions is noted throughout the book. There are mistakes of fact in the text, however, in an evident attempt to prevent readers from using the book as a yardstick of development to label a child "slow" or abnormal. It is wrong, for example, to leave the impression that most "three-year-olds are . . . three times as heavy as newborn infants" or that most infants take their "first wobbly steps . . . at the age of fourteen or fifteen months." The "average" baby well exceeds these figures.

The book also includes a glossary of terms. Most pediatricians will find this a useful book to use with parents and young adolescents. It will not have much applicability with younger age groups.

Pediatric Allergy. By Robert Chobot, M.D. Price, $4.50. Pp. 284, with 13 tables. McGraw-Hill Book Company, Inc., 330 W. 42d St., New York 18, 1951.

This is a fairly compact, easily readable book on an increasingly important subject. In the preface, the author states that it is written for the student, pediatrician, and general practitioner to enable them to diagnose and treat allergy in children better. He also says the pediatrician will undoubtedly disagree with the importance he places on infections and the removal of tonsils and adenoids in their relationship to allergy. This is cetrainly true, or at least the present trend is away from doing so many tonsil and adenoid operations. Another way of expressing the trend is to state that stricter criteria should be required for doing this operation on the allergic than on the nonallergic child.

The chapter on forms of hypersensitivity simplifies, in slightly different terms, the same old division of atopic allergy as distinguished from contact, drug, and serum hypersensitivity. This lack of a new classification again emphasizes the great need for some sort of standardization of much in the field of allergy, such as not only terms and classifications but also protein content and dilution of allergy extracts.

The discussion of diagnostic procedures rightly emphasizes history taking and reduces skin testing in importance as factors or aids in allergic diagnosis in children. The explanation of scratch, intradermal, passive transfer, and patch testing is fairly short but routine. The importance and space given to foci of infection are out of proportion to the importance of the subject. In fact, to put infection as a main or major cause in most of the allergic manifestations is contrary to majority opinion. It has been emphasized and shown by many writers that when the allergy is properly controlled the infection, which is usually secondary, will frequently clear spontaneously and/or be less likely to recur. The discussion in this chapter of psychogenic factors is brief and to the point, but also, here again, Chobot's minimizing of the importance of this contributing factor is contrary to most of the modern schools of thought.

The discussion in the chapter on asthma is pretty much standard and, as is the whole book, brief and not too detailed in analysis. Here, again, the author emphasized his viewpoint on bacteria and infection as major causes of asthma.

In the chapter on food allergy, he emphasizes the necessity of viewing with caution and some skepticism skin tests for foods. The positive skin test results should be verified by clinical trials. Elimination diets, as well as overfeedng of single foods, are used for this type of testing.

Vasomotor rhinitis, described as the commonest allergic condition seen in children, and hay fever (pollen and mold) are discussed in a rather brief but routine manner. The use of the antihistamines only as temporary reliefs or adjuvants is recommended.

In discussing skin allergies, he emphasizes two members of the usual triple viewpoint needed —dermatological and allergic—but fails to show the importance of the pediatric or general treatment viewpoint. In fact, the whole book shows this same lack of a general pediatric approach.

This book should be well received, as it fills a need in a special field.

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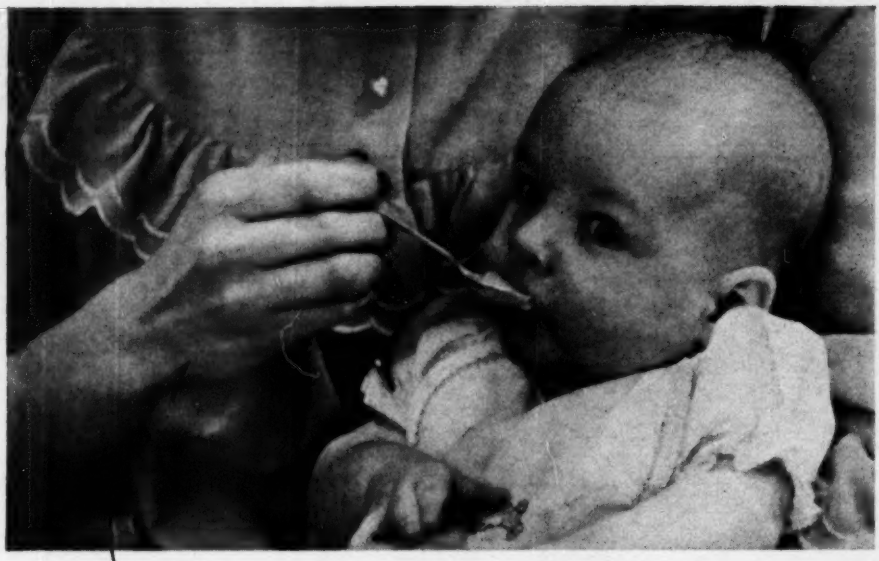

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1. Frank, P.F., Wilcox, C., and Finland, M.: In Vitro Sensitivity of Coliform Bacilli to Seven Antibiotics, J. Lab. & Clin. Med. *35*:188 and 205, 1950.
2. Jawetz, E. and Coleman, V.R.: Laboratory and Clinical Observations on Aerosporin (Polymyxin B), J. Lab. & Clin. Med. *34*:751, 1949.
3. Pulaski, E.J. and Rosenberg, M.L.: Use of Polymyxin in Gram Negative Urinary Tract Infections, J. Urol. *62*:564, 1949.
4. Kagan, B.M., et al.: Polymyxin B and Polymyxin E, J. Lab. & Clin. Med. *37*:402, 1951.
5. Lieberman, D. and Jawetz, E.: Treatment of Chronic Shigella Infections in Children with Oral Polymyxins, Pediatrics *18*:249, 1951.
6. Jawetz, E.: Infections with Pseudomonas aeruginosa Treated with Polymyxin B, Arch. Int. Med. *89*:90, 1952.

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1. **Gaul, L. E., "Overtreatment Dermatitis", J.A.M.A., 127:439-442, 1945**
2. **Pillsbury, D. M., "Physiological Principles in the Management of Dermatitis", New Eng. J. Med., 244:423-429, 1951**
3. **Underwood, G. B. and Gaul, L. E., "Overtreatment Dermatitis of the Feet," J.A.M.A., 130:249-256, 1946**
4. **Miller, H. E., et al, "Overtreatment in Dermatology", Calif. & West. Medicine, 51:251-253, 1939**
5. **Lane, C. G., "Therapeutic Dermatitis", New Eng. J. Med., 246:77-81, 1952**

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1. Bockus, H. L.: Gastroenterology, Philadelphia, W. B. Saunders Co., 1943, vol. II, pp. 510-511.
2. Seidmon, E. E. P.: Am. J. Digest. Dis. *18*:274 (Sept.) 1951.
3. Mitchell-Nelson: Textbook of Pediatrics, ed. 5, Phila., W. B. Saunders Co., 1950, p. 808.
4. Schweig, K.: New York State J. Med. *48*: 1822 (Aug. 15) 1948.
5. Bargen, J. A.: Gastroenterology *13*:275 (Oct.) 1949.
6. Newey, J. A., and Goetzl, F. R.: Permanente Found. M. Bull. 7:2 (July) 1949.
7. Musick, V. H.: J. Oklahoma M. A. *43*:360 (Aug.) 1950.
8. Vignec, A. J., and Mitty, V. C.: J. Pediatrics *40*:576 (May) 1952.

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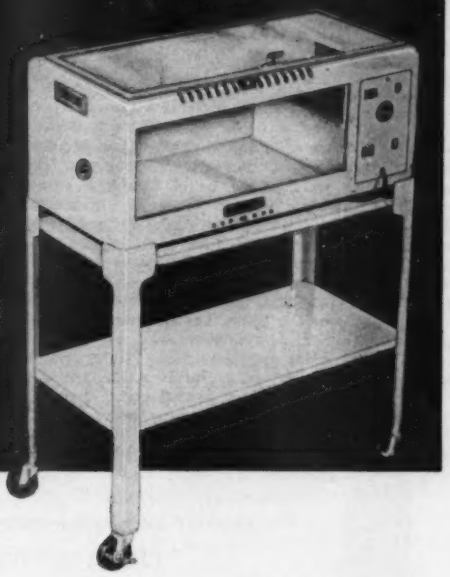

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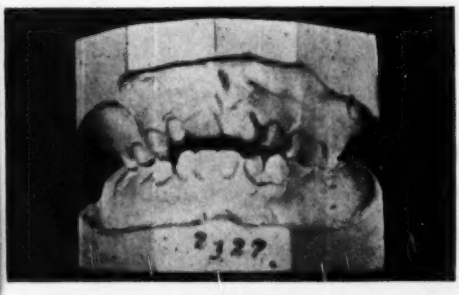

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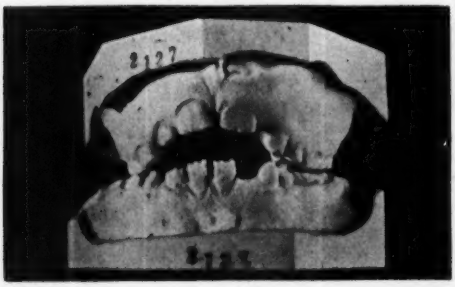

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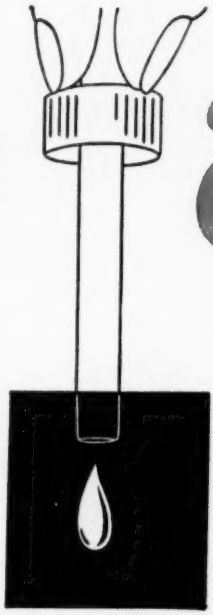

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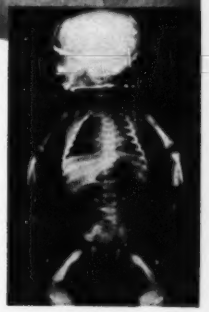

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Dosage for infants, 2 drops; for older children and adults, from 4 to 6 drops daily in milk.

Supplied in bottles of 10 cc. and 50 cc. with dropper.

Also Drisdol in Propylene Glycol (10,000 units of vitamin D_2 per gram) in bottles of 5 cc., 10 cc. and 50 cc.

To help build a sound structure and promote growth

Drisdol, trademark reg. U. S. & Canada, brand of crystalline vitamin D_2 (calciferol)

Winthrop-Stearns INC.

NEW YORK, N. Y. WINDSOR, ONT.